Perth 1/2" 1/3

West

Eagle

Eldora

Eldora

Arastra Creek

Boswell

Eagle

West slope

Tilted Rock

Cirque

See Photo 5

Baker Creek.

Looking S. E. from camp Eldora

Tilted Rock Cirque on Baker Creek

146
107
64
96
413.

60 — 10
20 — 2
15 — 0
96 0

SAWBACK RANGE
Pipestone Pass

~~Photo~~ Sawback Range Pipestone Pass

Sawback Range.

Vicinity of Pipestone Pass.

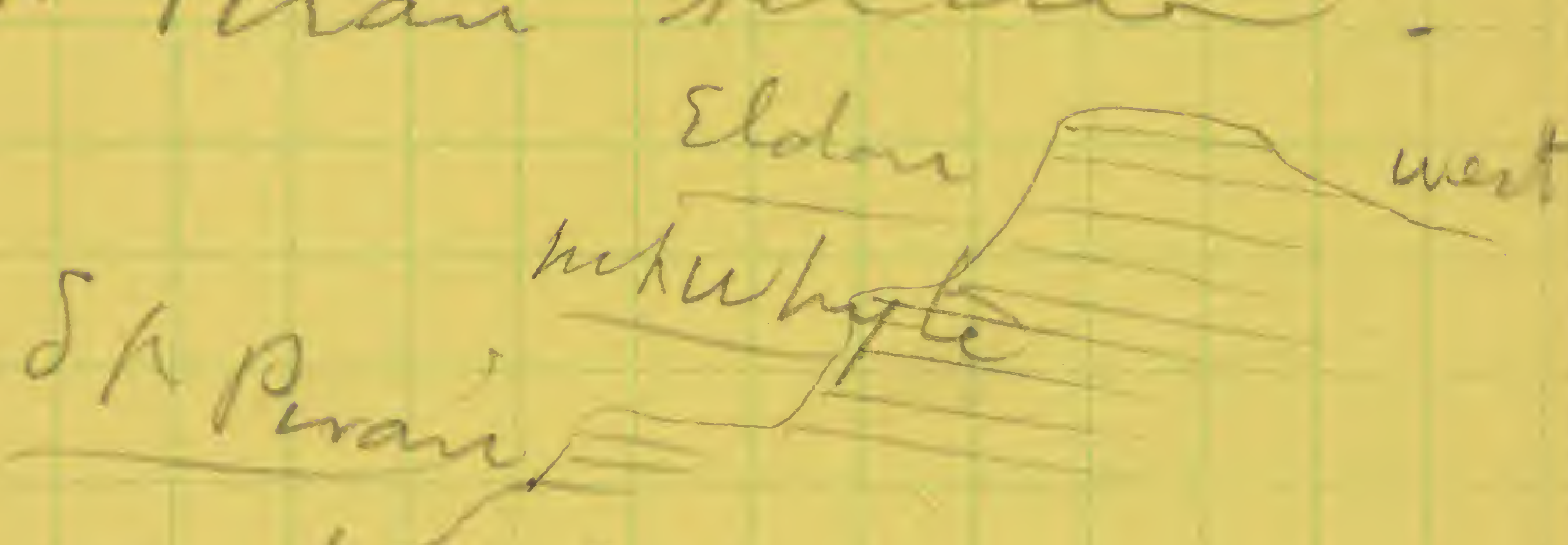
Broad U. shaped canyon north & south of the Pass is eroded largely in the lower Banff shale with the Lower Banff limestone forming the eastern side of the canyon & rising at a slope of 30° to 50° to the Eastward facing sharp jagged cliffs two to three thousand feet above.

The western side of the canyon rises abruptly to a broad terrace formed by sandy shales & a massive bed

Qtz-

Qtz'sh Shale

of small qtz conglom-
erate that appears
to mark the plane
of the overthrust
of the Lower Cambrian
on the Banff shales.
The Cambrian beds
dip S.W. 6° to 10°
The higher cliffs
+ points are formed
of the Eldon limestone
with the Mt Whyte &
St Piran below.



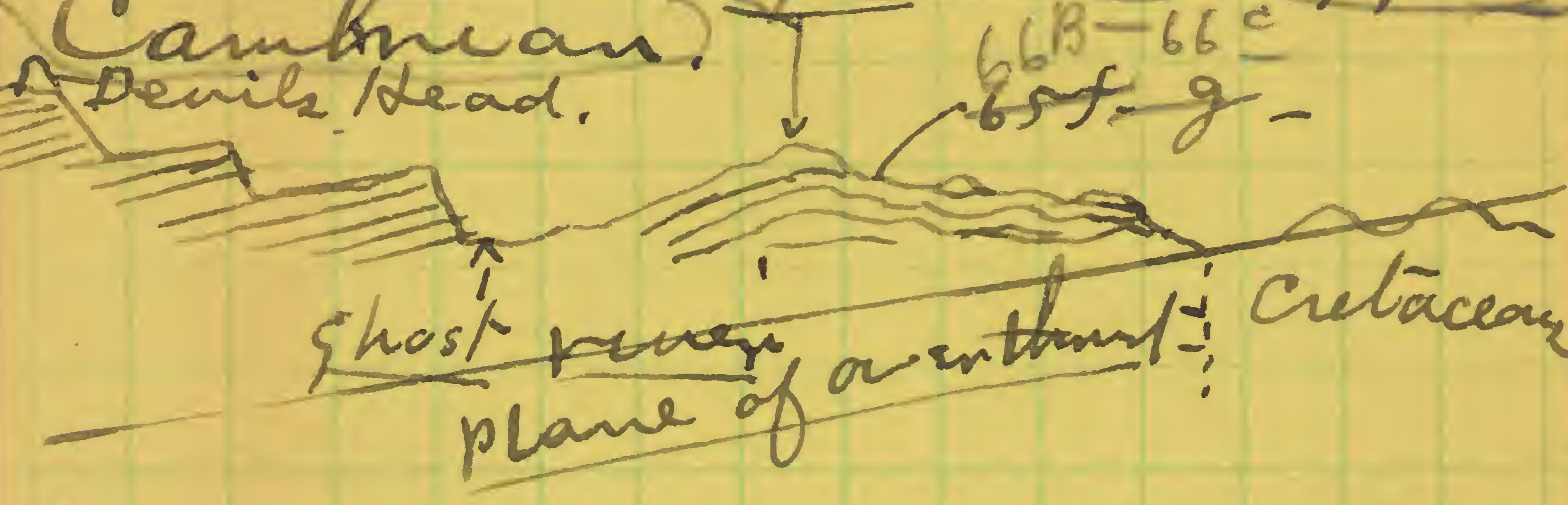
The eastern profile of the
cliffs is similar to
that of the western
side of Upper Bow
valley. ~~& the~~

ak Prestage Pass a ~~foot~~ hill of the Bantt shale lies on the western side with thin shaly sandstone capping it the largest part of the pass being at the contact of the shale & the Bartt limestone.

Ghost River 1920

July 9/1920

Marsh Mountain Middle Cambrian.



Marsh Mt. is a mass of Middle Cambrian limestone that is now about 2 miles further east than the cliffs of the Rocky mountains front in the vicinity of Devils Gap, Ghost river gap, Saddle Peak, Mt. Costigan & Devils Head. It is an ~~great~~ outlier & from the eastward ~~rising~~ ~~dip~~ slope of the Cambrian strata it brings up the oldest known Cambrian limestones in this section of the Rocky mountain front.

The summit of the mountain is formed of massive bedded, gray, ~~ma~~ weathering limestones that correspond in character with the Cathedral limestone of the Mount Bosworth section. The strata are more or less displaced ~~broken~~ by local faulting & ~~by~~ are broken down by weathering.

The Alpenella shale & the Cathedral limestone are also well exposed in the lower cliffs of the "Rocky Mountain front" at the Ghost River & Devils Gap canyons.

a[redacted]

July 15/20 15 July 1920

Ghost River Canyon

Section of Cambrian rocks 1/2 mile below mouth of Ghost river canyon ~~Alberta, Can.~~

(Going up)

1a) massive bedded gray limestone - ft. 870
at 220 ft a band of ~~same~~ thin bedded bluish gray lime occurs.
at 870 ft the massive beds give ~~way~~ to thin beds that form a slope back from the cliff.

1b ~~gray~~ thin bedded gray limestone with abundant annelid trails on weathered surface - ~~fragments~~ ~~of~~ 252.

21
105

1st Contd

Fragments of trilobites in upper layers. Same horizon as 65.

Hyolithes.

Total Cambrian thickness. 1122 ft

Base not exposed.

Strata in last interval

1. Gray-buff medium hard thin bedded magnesian limestone breaking at 120 with thicker layers and again into thinner layers - 30 feet a little shale in interbedded at about 175 feet.

285 ft

The thinner shaly layers have the appearance of rivers slimy mud

29
143
18

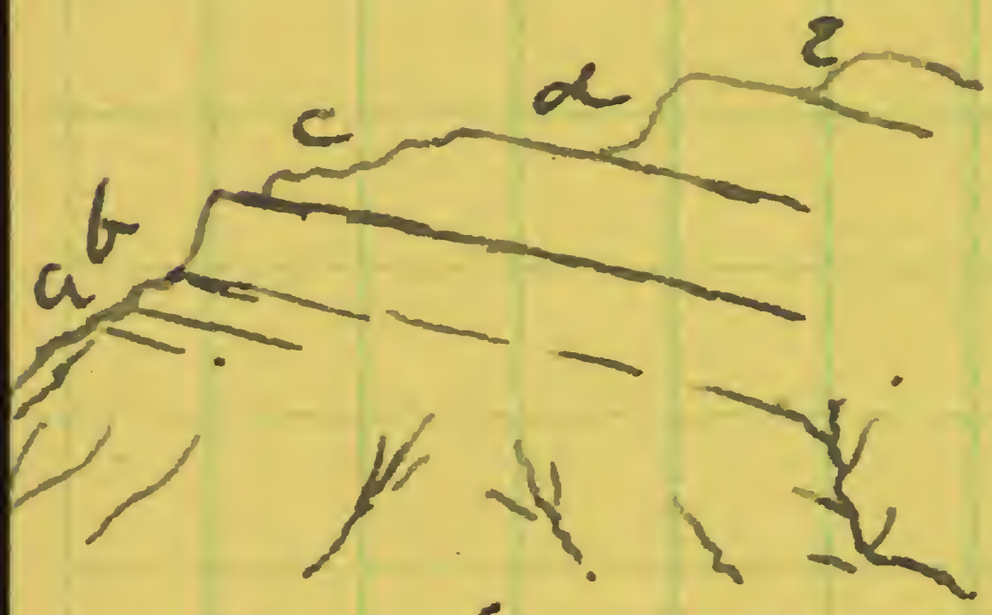
163

mud in a shallow
body of water.
At the summit of
there is a very slightly
undulating surface
that with a layer
of coarse dark gray
brecciated [illegible]

1920

Devils Gap. July 10/20.

Middle Cambrian cliffs at entrance to Devils Gap leading up to Lake Minnewanka.



Dip - 8°-10° S.30°W
St. E.30° S. (mag)

a Middle Cambrian. Gray, siliceous rough weathering limestone.

b. High cliff (300 ft?) of massive bedded gray limestone with a band of thin layers near the base that weak away & form a shelf loaded with debris from above.

Fauna in layers at base 65 ft. (& 165 ft of massive section). (Middle Cambrian)

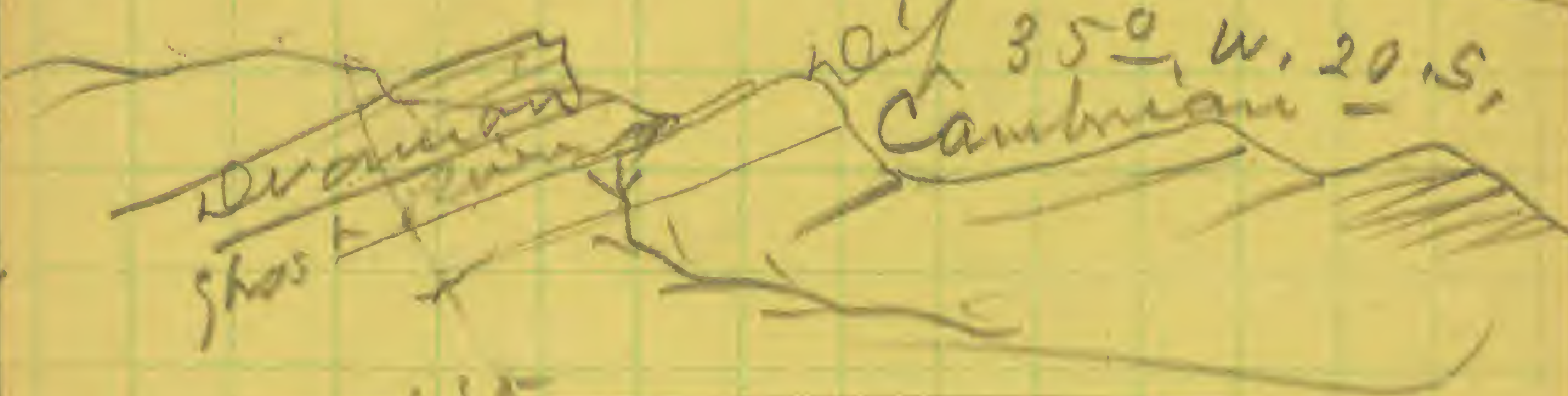
c. ~~Similar to b~~ Alternating thick & thin bedded limestones forming a broken slope ~~400 feet~~ that caps most of the cliff facing eastward. This series is about 400 ft thick.

d. Massive bedded dark gray lyr forming a cliff ~~back~~ considerable distance back from the lower eastern wall.

e. Dark - coarse rough weathering limestone with abundant Stromatopora. This often forms the talus of nobs & buttes.

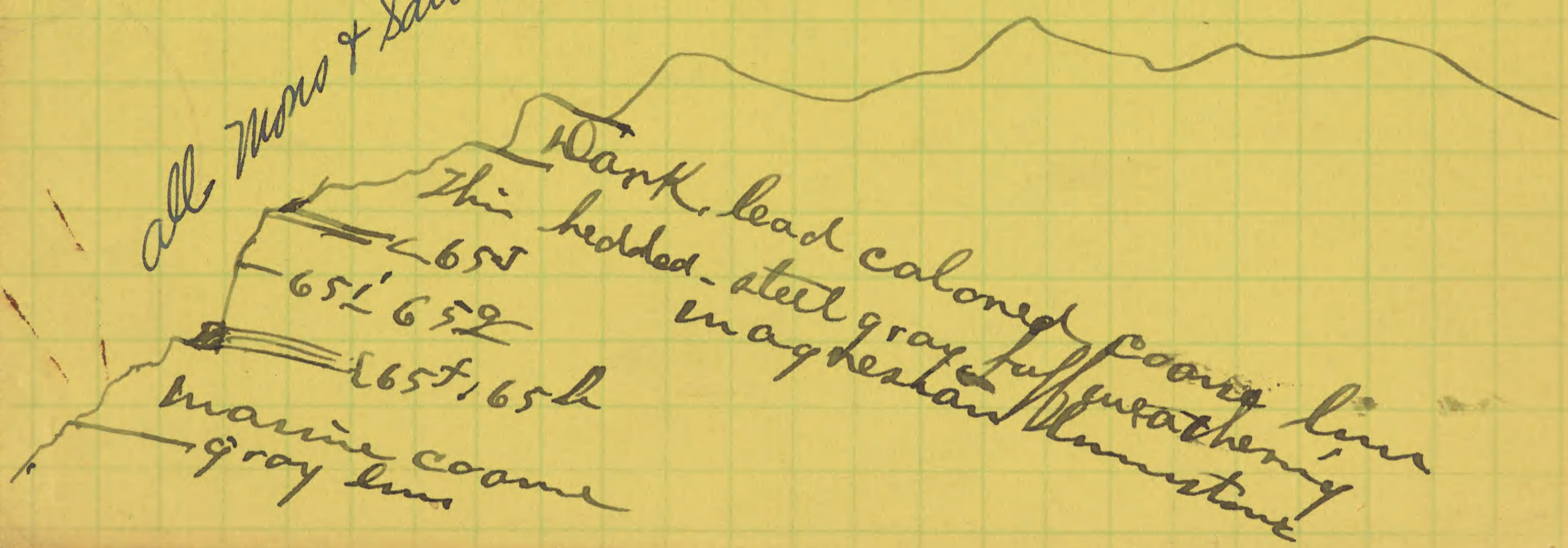
p. 21

1 (Devils Gap) Cambrian



Locality 2 mi. E.N.E. of head of Lake Minnewanka on ~~north~~ side of a broad ~~glacial~~ canyon called Devils Gap wh ~~Alberta Canada~~ is about 51 miles (km) west of Calgary Alberta Canada. The gap extends back from the east face of the cliffs ~~for~~ 6 miles (Km) to Lake Minnewanka at right angles to the strike of the westward dipping strata so as to expose the Carboniferous

Section between Devils Slide
& Ghost River canyons on Rocky Mtn
Front. July 14 – 15 1920. Lees



Ghost River 7/1920

alberta ~~Ghost River~~

Lower Cambrian ~~July~~ 7/20

~~Ghost River~~

directly across from the mouth of Ghost River canyon & a little south of it the river has cut into the western base of Marsh Mt.(1) so as to expose ~~quite~~ a thin bedded gray series of sandstones, greenish & purplish shales, the surfaces of the thin layers of sand stone are almost covered with trails of small & large annelids & bits of the tests of trilobites. These are ~~fr~~ seen on freshly broken surfaces. The cliff is about 100 feet high & is formed of contorted & ~~[illegible]~~ broken layers dipping roughly toward the river, where ~~rough~~ broken down ~~they form~~ a steep slope to the river.

4. 2 Shoshone River

The shape above the cliffs is covered with soil with 100 feet or more ledges of darkish gray coarse weathering limestone that from the ~~structure~~ of Marsh Mountain is evidently a part of the middle Cambrian bed of limestone that forms the eastward facing cliffs at the summit ~~& which is of middle Cambrian age.~~

From the position & character of the sandstones & shales it is highly probable that they represent the arenaceous beds of the upper portion of the Lower Cambrian ~~the~~ beneath the ~~Cathedral limestone &~~ Mt. Whyte series of the Mount Bosworth

section. If this interpretation is correct the Cambrian section of the Grant Range between the South Fork of Ghost River and the South Fork of Panther River probably still further west will include the St. Piran + the lower Cambrian + the Ptarmigan formation + the middle Cambrian with the section terminating alone at a plane of unconformity resulting from the mountain building in this region of Alexandra + Upper Cambrian + later formations of the Devonian.

Fatal ... Whyte 752,

Lower Cambrian

St Piran formation

massive purplish
colored quartzitic
sandstones 20 to 30
feet & then light gray
quartzitic sands with
occasional bands of
greenish finely arenaceous
shale to debris at foot
of cliffs -

gray limestone in
massive beds, breaking
down on slopes — Quickly
becomes more massive
bedded & cliff forming
& passes into a gray
coarse rock

154,

2 Deep bluish gray
massive bedded
coarse limestone marl
or less mottled on
weathered surface.
In bands breaks
up into thin beds

144.

3.
Light gray rough
weathering lime-
in massive layers
6 to 50 feet thick.
mottling & annelid
boring

122

Total 434 ft

121

Lower Cambrian
Mt Whyte formation,

1) Thin bedded, rough surfaced bluish gray limestone. passing into coarser magnesian buffe weathering thin bedded limestone, 60 ft
Fragments of trilobites

2) massive bed of gray limestone with stringers & nodules of magnesian lim, 12 ft

3) Coarse - silico-argillaceous shale dirty gray in color — 5 ft

4). Bluish gray limestone in beds varying 2 in to 20 ft in thickness, Some beds oolitic near the summit & canyons

8 – 5 – 6

4. Niviva, Hyalithes & fragments of trilobites — large & small, 32 —

5. Rough arenaceous shale with annelid trails, grey-weathering dirty buff brown — thin layers of bluish-grey limestone interbedded in lower portion 36,

6 Light gray lime with stringers & splotches of buff weathering magnesian lime, 6

7. Dirty green earthy siliceous shale 24

8. Similar to 6. 45

9. " " 7 30

10. Spotted, platy, bluish gray lime 96 ft +

passing into banded
arenaceous + calcareous
massive layers 120

11, Thin bedded rough
sandstones & shale
with a few
calcareous
layers 32

12) Massive bedded
oolitic + hard
grey limestones
that break up into
thin irregular layers. 44

13,

~~add 8 - 1 -
section, following
a small fault
displaces 14 + 15 - about
60 feet the down-cut
w.~~

6

13. Quartz sandstones in layers 1/2" to 14" thick with arenaceous shaly partings ① 60,

① (footnote)
(a small fault of from 50 to 75 feet here cuts the section but the two parts are exposed in the cliffs facing north & along the talus slope of a small glacier)

14. Greenish siliceous shale — 12

15. Massive bedded gray more or less oolitic limestone 68

Fauna 63x —

16. Greenish siliceous shale — 7 3

17. Massive bedded gray, hard limestone, with many layers oolitic. The massive beds break up into rough layers 1in to 8in thick on weathered slopes 72,
Fauna 63v

18, Greenish siliceous shale — with oblique cleavage 44

19, Steel gray — rough weathering, hard — fine grained siliceous limestone 24

20. Slightly calcareous coarse, massive bedded sandstones 30,

(of Mt East of) 13 Aug 1918
Mt Thompson - Ross Lake. Aug 13/18
Section on East face
of Mt Thompson at
head of Ross Lake,
Genl. Strike of Stephen & Cathedral
N. 60° W. (mag). Dip
about 15° - 20° S. W. —
Middle Cambrian
Cathedral formation,
massive bedded coarse-
gray - rough weathering lime!
'Ptarmigan formation,
1. Bluish gray massive
bedded [illegible] (thin layers
in).
108'
Neolenus (fragments) —
2/ Ross Lake shale, i.e.
black, siliceous shale
with Albertella fauna,
(63w) 6 ft
3. Thin layers of bluish

29
174

24
144

37
222

"Sawback" 1921

Aug. 1" / 21.

Overthrust fault between Cambrian quartzite of Castle Mountain at head of Thompson creek and divide and the head of the second S. E. fork of Baker creek. This fault has a N. N. W. & S. S. E. trend and has thrust the Cambrian quartzite over onto the Cherty limestone of the upper Jurassic of the Sarbach formation. The Ordovician beds dip southeast at an angle of from 50° to 55°. The quartzite have the same dip near the fault thrust but decreases to 30° a short distance from the fault thrust. In the southeast on

the line of the Jahuson
canyon the inferred
plane of the fault
cuts across the Devonian
& between the southeastern
end of Castle Mtn & the
Sawback range there is
an undulating series
of Devonian limestones
that are pushed up
against the steeply
inclined Carboniferous
limestones that are
superjacent to the Devonian
& the Ordovician (Sawback)
limestone which on
Ranger canyon are a
mile or more back in
the Sawback range from
the line of the Thompson
deride thrust fault.

Thompson Creek Reverse fault.

Thrust

Sawback range

E. Reverse thrust fault.

Castle Mt.

middle Cambrian limestone

Upper Cambrian

Ordovician (Sawback?)

Flathead Cambrian quartzite

8/1920

Aug, 1920

Characteristic Section

Upper

This section is 33 miles (Km) East southeast of Glacier Lake section; 20 miles (Km) S.S.E. of Sifleur section; 54 miles (Km) N.W. of Ghost River section and 27 miles (Km) N.N.E. of Mt Dennis section of Allan. It includes the Devonian beneath the Banff shale of the Carboniferous; the Ordovician Sarbach formation & the Upper Cambrian Lyell formation.

(Leave 4 in for a diagramatic outline of section.)

The broad canyon of the Siffleur is eroded in the eastern pole in the Banff shale which rests on the light gray Devonian limestone which is ~~Devonian~~ Mississippian at the head of the canyon at Pipestone Pass on Devon Mt. & the northward extension to the head of Clearwater Canyon where the Devonian beds are cut across. Abruptly at a right angle to their southwesterly flip.

The Devonian of Devon Mt. ① was not measured in detail but it was estimated to be at least 1200 ft (m) in thickness. The measured section began about 1.5 miles (Km) east of the divide at the head of the Clear water canyon

1st book note to p. 1a

The sharp ~~eastward~~ facing point rising on the East side of Pipestone Pass I wish to name **Devon Peak** (9300+) & the glacier on its N.E. side facing Clearwater canyon Devon glacier. The peak is formed of Devonian rocks & the glacier rests in a cirque eroded in same.

which is formed by an old moraine of the glacier that flowed down the Sifton Pass. It is about 20.5 miles (Km) in an air line north of Lake Louise station on the Canadian Pac - railroad

Section.

Remarks.

1. Light gray evenly bedded limestone in layers from 3 in (cm) to 2 feet (cm) in thickness

Estimate 1200ft +

Fauna - Collected only a few fossils in upper part - Corals etc.

~~Devonian (lower)~~ The line between the Light gray limestones of the upper division of the Devonian & the dark lead gray of the lower division is most marked & can be recognized miles away by the contrast in color: the two formations also give rise to different topographic forms as the upper division breaks down ~~[illegible]~~ readily into terraces & ~~show~~ cliffs when ~~[illegible] at a low an~~ the dip is nearly horizontal while the ~~dark~~ lower division forms dark cliffs: with a steep dip the upper division forms sharp high points or ridges & the lower

1E

division a ~~series of~~ more or less broken cliff capping the ~~light~~ gray pre-Devonian beds beneath.

2. Section measured from top downward of lower division.

(CL1)

~~Section beginning from top down and~~ ~~Devonian~~

Strike W. 2° N (mag

Dip. (35°. S. 20. W.)

1a Dark arenaceous more or less bituminous ~~shaly~~ in ~~thin~~ beds ~~breaking down into~~ layers — 3 — 6" thick 45 ft

1b) gray ~~buff~~ weathering shale gray lime, sponge beds weathering buff 3 ft

1c) Purplish finely arenaceous shale with thin layers of lime. 24 ft

1d) Thick, bedded dark arenaceous lime, 11 ft

~~abundant brachiopods Devonian~~

(E) Dull 3 finely
bead gray arenaceous
lime with corals +
Stromatopora very
abundant

184

(F) Similar to (d)
with Stromatopora
bed 20 feet thick
35 feet from base

270.

Fossils
Stromatopora
Small branching
corals -
Atrypa reticularis
Gastropods
occur 30 to 60
feet from base

Total dark
lead colored,
arenaceous
Devonian 663 ft

and 120 feet from base
Algha reticulara.
Gastropods
Cephalopods
fragments of Trilobites
occur in a bluish
black limestone.

3a

(Going down) Aug 24/20,

The Devonian terminates at the base in thin bedded dark dirty gray layers. at 25 to 30 feet (m) from base a ~~[illegible]~~ band of bluish black compact limestone is quite fossiliferous also the shaly partings between the layers –

Stromatopora –
Favosites (2 or 3 sp.)
Atrypa reticularis

Gomphoceras

Bumastus ?

The limestone rests on the somewhat lumpy & uneven surface of

21

 aug 24/20.

~~the adjacent quartzite.~~

over → (a)

Ghost River formation.

1) massive bedded light gray to white quartzite. 24"

Upper surface somewhat hummocky & uneven. Base level but exposures are very limited in this vicinity. Lower (b)

No. II. Ordovician +

(a) Sartach Formation

~~Gray & purplish~~ tinted contact massive bedded pale lavender weathering limestone breaking into large blocks & a few thin layers. 32 ft

a ... & fractures on the weathering [marginal note in oval, partly illegible]

Purple mottling occurs in some beds

(a) Such is all that there is representing the Ghost River formation between the base of the Devonian + the subjacent massive limestones of the Sarbach (Ordovician) formation.

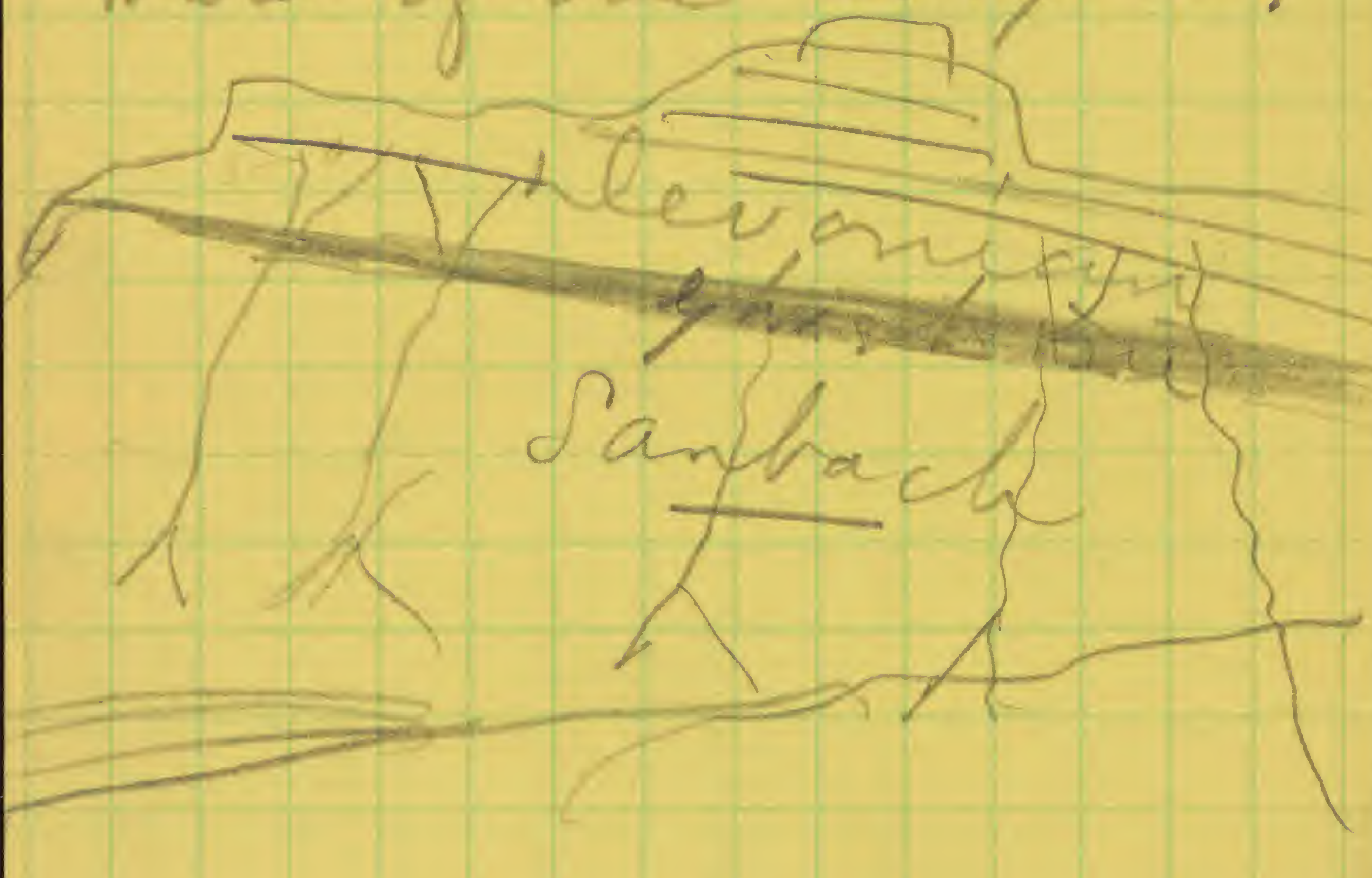
---

b

This 24 feet (m) of ~~clean~~ quartzitic sandstone is all that represents the 500 feet in thickness of deposits ~~between~~ that occur elsewhere to the southwestward ~~between the~~ Sarbach & the Devonian also the 285 ft (m) in thickness of (magnesian) dolomitic ~~rocks~~ strata of the Ghost river section (ante p. —).

Ghost River formation.

The upper red yell. the Ghost river formation near the head of Clear-water canyon thickens up east of where section was taken to 40-50 ft & then thins out & disappears at the top of the high cliff on the south side of the canyon.



5.

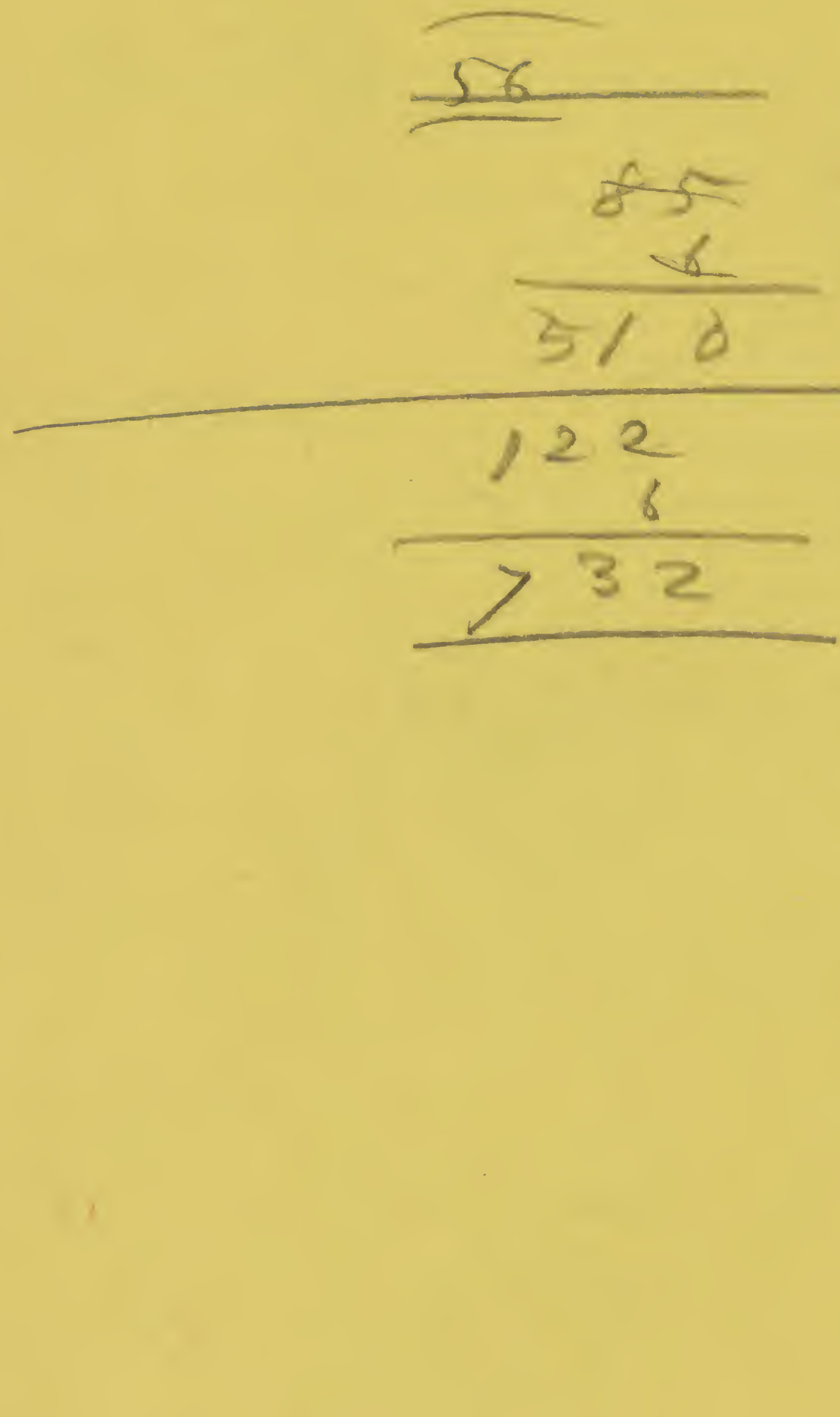
Annelid trails on surface of some layers & borings ~~of~~ more or less scattered thru the layers.

Dip. 35° S. 20° W.

b) Same as (a) except that the color is a more uniform dark tint with occasional purplish tinted thin layers interbedded.

At 198 ft (m) from top noted fragments indicating fractions of coiled shells.

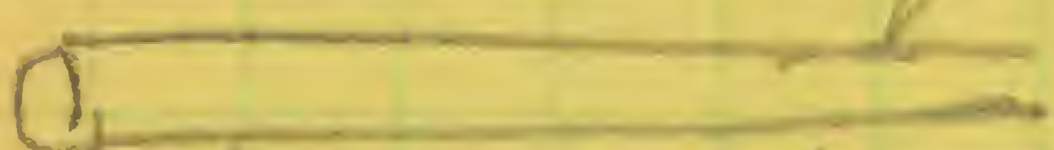
At 282 feet (m) from top a few cherty nodules occur and at 312 feet (m) stringers of nodules parallel to bedding.



65R at 336 feet (m) from
top found gastropods
 —

65S at 510 feet (m)
numerous sections of
a flat gasteropod
occur.

65T at 540 – 550 ft. (m)
Receptaculites +
sections of gasteropods
Small Stromatopora abundant

65U at 680 – 720 – small
Stromatopora – tubes
 + sections
of gasteropods

At the horizons where
fossils occur the layers
carrying them are
darker & more granular
than is at 336 – 510, 540

7

+ 680 feet (m) from top of limestone.

Total of 1b 730 ft

(Foot note Section here taken across ~~to north~~ side of Chiamaten canyon as the)

The base of 1b usually ~~marks~~ occurs at talus slopes formed by the breaking down of the adjacent thinner layers + shaley partings. Where a sharp ridge occurs the massive limestones form a great cliff + the beds below a gentle slope or saddle to the next massive harder more compact band of layers. Latter is eroded so as to shape ~~the strata~~ almost across the strike. The continuity of the section

8

is assumed both by the topography (
lithology & the presence
of similar fossils.
North Ridge where
No 2. of Sarbach formation.

Clearwater canyon
has an east & west
direction. At the
east end of North
Ridge the canyon bends
north and the
Lyell formation is
best exposed on the
northeast side of North
ridge & west side
of Clearwater canyon
^

17
102

Going [illegible] Aug. 29-30.

2a Gray & bluish gray thin bedded limestone with many fossils 60 ft

65 Fauna

2b Thin bedded gray hard silicious limestone with interbedded bands of shale & shaly limestone 310 ft

2c Bluish gray shaly & thin bedded limestone 40 ft

Numerous annelid trails on surface & fragments of trilobites 410

1d Hard steel gray & dark gray limestone in massive beds above with about 50 ft of thin layers below

652 In the lower portion numerous annelid trails & closely coiled ophileta like shells 232 ft

232

to

2e Light greenish calcareous shales with thin bedded to shaly gray limestone interbedded 498 ft.

Fauna. Immense numbers of annelid tracks fragments of large Orbiteles.

2f Light-gray calcareo-argillaceous shales, with beds of intercalated gray interformational conglomerate in layers 1" to 12" in thickness; also of nodular shaly gray limestone. 528 ft.

(65y) Fauna Af 288 ft from the base fragment of a large Asaphoid Illaenid occurs, also a few brachiopods.

Fragments of Orbitites occur all thru 1e

1d Pearl gray calcareous shales with a few thin layers of lime above with alternating gray buff 62 ft.

(65w) Fauna Tails & fragments of Orbites

11.
Seafood Trilobite
Saukia
Symphysurina
Ectenoglossa

1E Gray limestone in thin uneven layers with partings of greenish calcareous shale. A few layers of uniformatheral conglomeratic limestone also occur 18ft

(65V) Fauna

Symphysurina (abundant)
Fragments Trilobites

1f Gray buff weathering clayey dolomitic limestone. 8ft

Fauna

(65X) Symphysurina cumilaustE

19. Thin bedded coarse dolomitic limestone, resting on massive bedded dolomitic limestone 48ft
St. 7h. 30° N. dip 20° S. 30° W.

Total of 2 1414

42

512 Sept 3d/20

Cambrian

Lyell formation

1a) Massive bedded ~~steel~~ gray — rough weathering with dark lead color, ~~dolomitic~~ limestone breaking down in bands of thin ~~bedded~~ layers 2 to 6 in thick.

910

1b Thin bedded hard gray finer grained limestone than 1a in thinner layers

140

1c Thin bedded gray lime — with some bluish gray softer layers △ oolitic layers 3 to 8 in thick

130

(66a) Fauna

1180
145
1325
125

6, 13

1 d Thin bedded hard gray lime with a few thin shaly layer 145

1 e Massive bedded steel gray hard rough weathering lime 500+

Cut off by an Extensive fault & overthrust –

Total Lyell

(Cliff) measured 1450
Estimated 375

1825

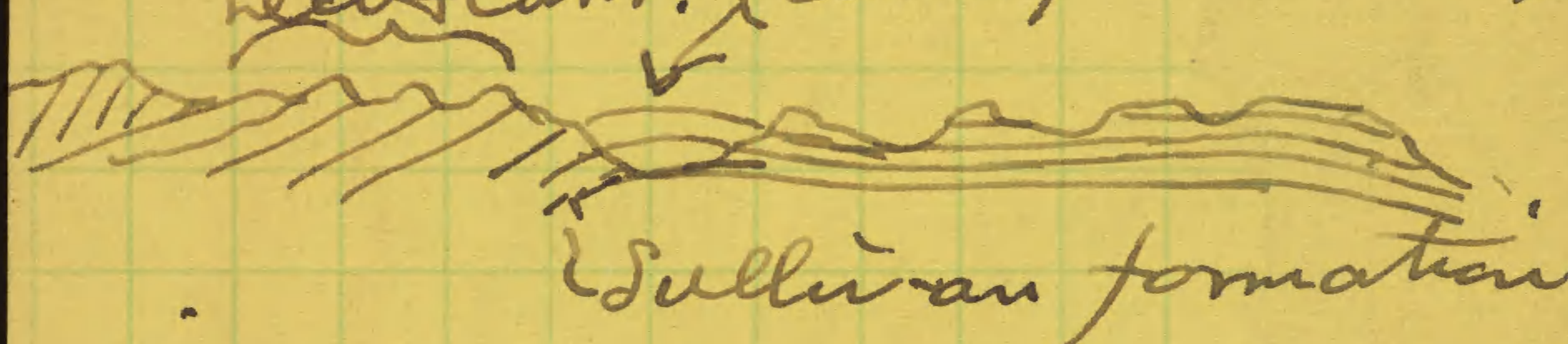
Some of the upper limestones of the Sullivan formation may form the lower portion of the cliff of 375 feet –

Fossils occur as fragments all thru but not identifiable.

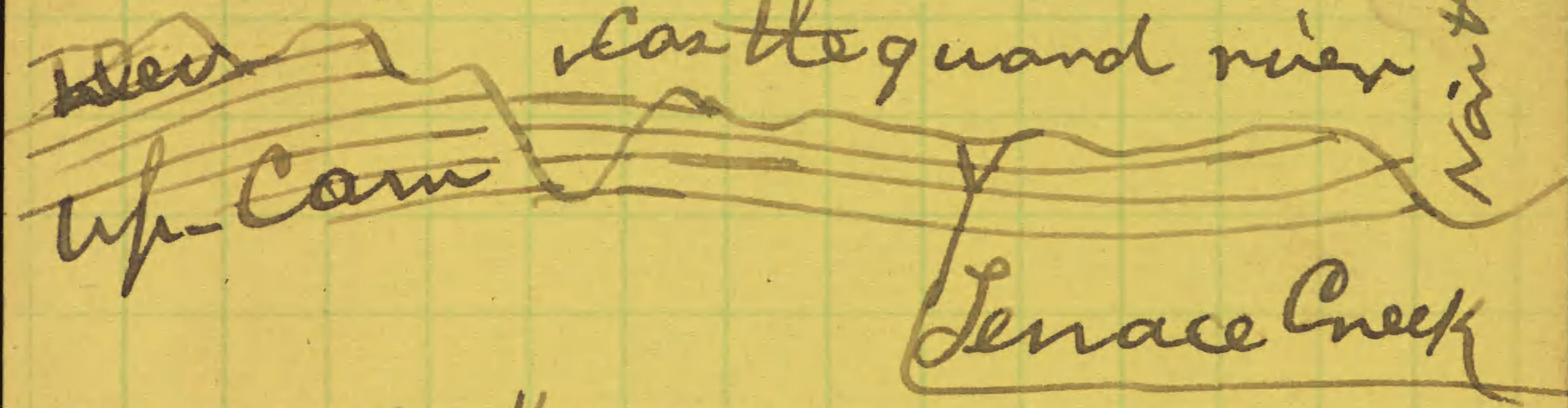
Continental Div. 9/1921
@ Thompson Pass

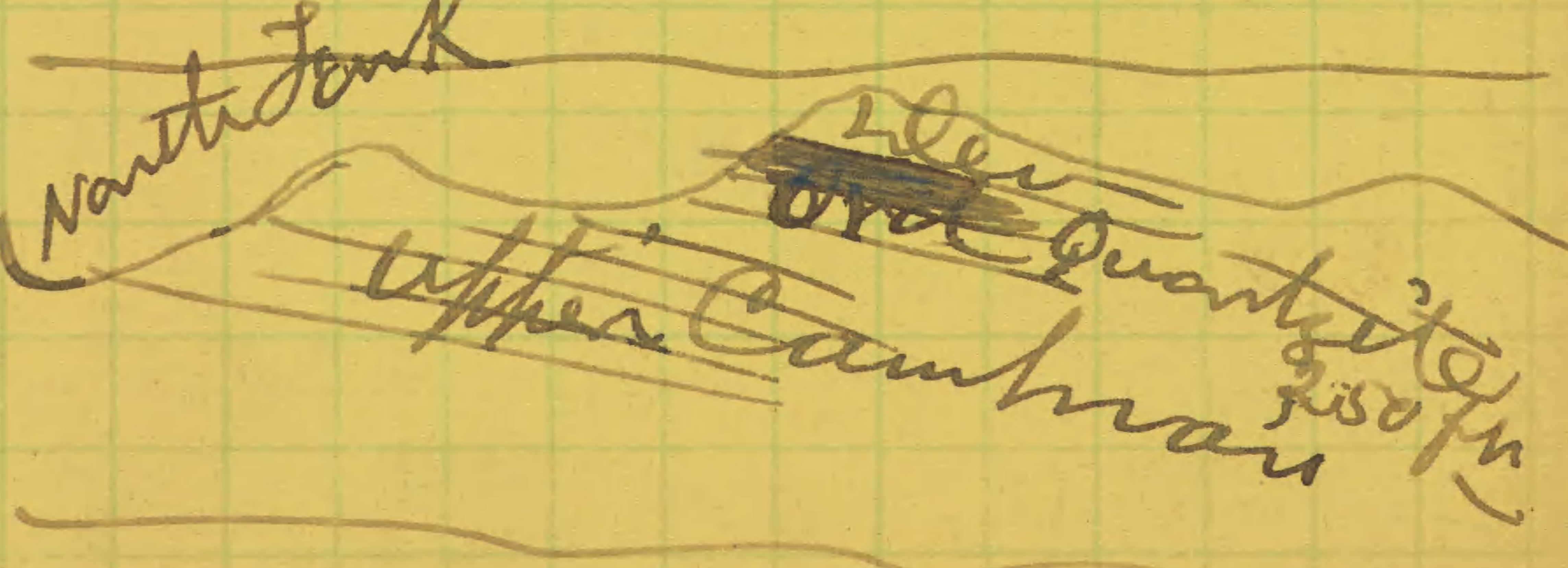
Sept. 6/21.

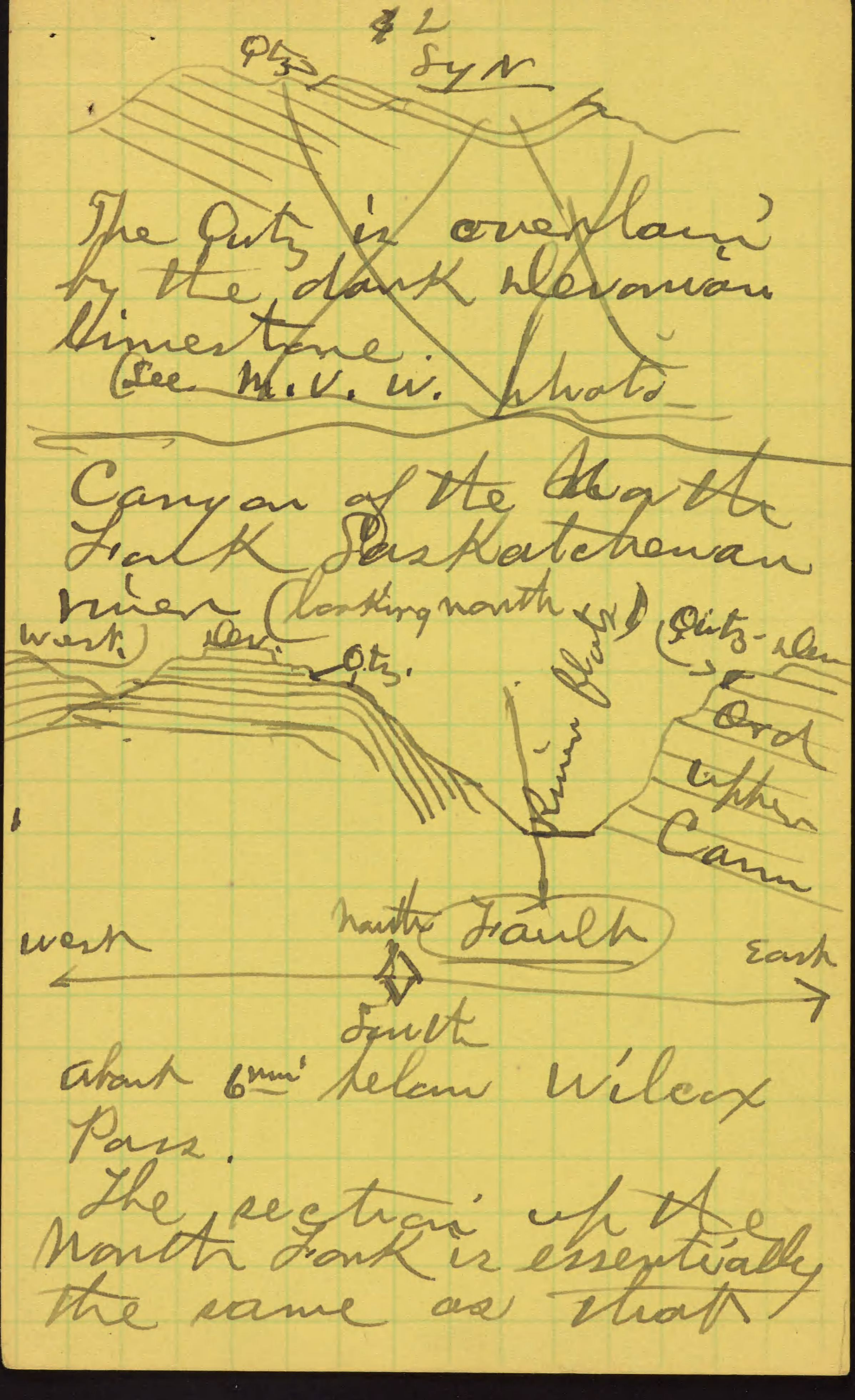
Continental divide at Thompsons Pass – about 20 mi. n.w. of Glacier Lake – The structure is essentially the same as at Glacier Lake



Alexandra river canyon S.E. of Thompson Pass.



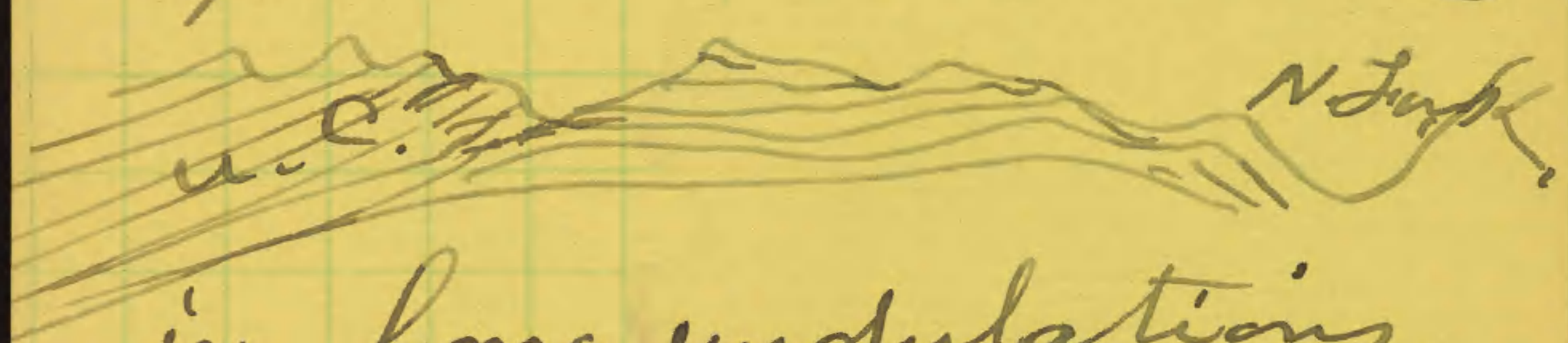




about 6 mi below Wilcox Pass.

The section at North Fork is essentially the same as that

of Glacial lakes —
the ridges extending
N. E. from the main
range are mainly
upon Cambrian rocks.



in long undulations
to the sharp down
turn on the west side
of the North Fork. The
Quartzite & Devonian
come in again on
Mr. Wilson & Mr. V. W
extention.

Sept. 15th

1E Aug 7/20

St Piran river section.

1 St Piran formation

a) massive light gray quartzite — with bands of sandy shales about 250 feet from top —

~300 —

(b) alternating thin bedded quartzitic sds. & ~~silicious~~ shale —

90 ft

(c) ~~Gray~~ Light gray qtz in layers 6 in to 36 in

380 ft

770

2 Mt Whyte formation

(a) Lead grey, oolitic lm ;

16 ft

Fossils (65N)

65N / Hyolithes
Olenellus cf. thompsoni.
Ptychoparia etc

$$
\begin{array}{r}
308 \\
124 \\
16 \\
\hline
446
\end{array}
$$

$$
\begin{array}{r}
470 \\
446 \\
\hline
916.
\end{array}
$$

b) Greenish gray Calcareous shale with a few thin layers of hard blue colored limestone 124 ft

c) Thin bedded gray lime with some shale & oolitic beds, (no fossils except bits of trilobite) 306.

Fauna (65c).

Fragments of a relatively large trilobite & a small tail  -

Total Mt Whyte 446 ft

E

4) Cathedral. This goes [illegible]

(a) massive layers gray limestone breaking up into thin irregular layers near base & passing up into massive band of gray rough weathering lime. 72 ft

72
36
108

42

3

(b.) Band of gray lime-stone similar in appearance to a but weathering on long exposed surfaces to a dark rusty reddish color.

36 ft

No 4^a of p. 2. comes in here

72 ft

36

108.

p =

Pg. 4 follows

610
520
1130
110

4. Aug 11/20.

Cathedrals go in before this.

St. W. 20 N.
dip. S. 20. W.

(a)
massive bedded, light gray finely granular on weathering breaking down into layers 1 to 4 in thick. (With lime) 260 ft

This formation occurs as a highly bold, cliff northward facing cliff for several miles south of the lower portion of the Sifleur river.

a broad shelf occurs at the top loaded with debris from the Elder cliff above. At the Cathedral escarpment front 125 of the base of the

58
6

348.

~~I think the Albertella fauna comes in at this horizon on the shelf – to be searched for later.~~

~~(b) Light gray lime – similar to (a) but more laminated & breaking down more readily into small cliffs & terraces but as the rocks rise ~~with~~ ~~the~~ to the N.W. ~~F~~ (b) unites with a & forms a great gray white cliff 600 feet high.~~

b = 350 ft

c.

See about Ptarmigan formation

744 ft
36
7260

Total Cathedral – 1240.

Cliff section facing north

5 Or

Cathedral.

5'20

shelf

a

9 260

Light gray
limestone
layers.

6 10
1 10
7 20

8 35

Lower Campanian
Chalk

4460

Sh Purple
770 ft
Base covered

$$
\begin{array}{r}
36 \\
\times\ 34 \\
\hline
260 \\
350 \\
520 \\
\hline
1240
\end{array}
$$

Copied Aug. 30/20 1 Aug. 13/20

Going up –

Top of upper dark limestone of Cathedral Mountain formation – Stephen

1a) Thin bedded dark bluish gray lime ~~breaking~~ weathering into small ~~shaly~~ angular pieces 10 5 ft

b. Bluish black hand shaly lime with annelid trails + fragments of fossils on surface – (65 f) 65 f 140

c) Thin layers of hand compact irregular dark + gray lime

24
120

2

in massive beds or bands 5 – 20 ft thick. 120 ft

d) Thin stratum of blackish limestone similar to c passing gradually into a steel gray hard fine grained compact lime with thin bands of black flaky & gray lime similar to c. 132.

497

Aretomys formation

a) Slaby & shaly hard compact gray-buff & reddish brown weathering lime some purplish beds along from 80 to 150 feet, also band of dark siliceous shale & a little

497.
470.
25
1222

57
285

27
155

green (3) in places 285

f.

steel gray fine grained, flaky lime in thick layers. weathering light gray 185.

470

g. thick bedded, dark gray, semihard lime-stone - with numerous interformational flaky irregular, certain - like pieces also round small dark carbonaceous

255.

Total Arctomys = 725

~~Sullivan Formation~~

570
170
240
156

1136

105
140
120
132

497.

565

96

5 / Sullivan Cont'd

~~b) dull~~ Gray to steel gray hard compact limestone with more or less oolitic lm scattered thru it. The lm is in thick layers 6 in to 3 ft that forms massive bands + a solid wall in the face of cliffs. 156.

c. Gray rough weathering steel-gray lm in ~~thick~~ layers 30

d) Thin layers of light weathering gray lm with darker layers between which gives a banded or ribbon-like effect on cliffs. 140

570
170
156
125
400
1421.
525
695

E) massive bedded steel
gray rough weathering
cliff forming firm –
in three (3) bands
240 ft.
~~Total 895~~

No fossils seen
except a few
annelid trails &
borings in c.d.e p.7 X

Lyell formation
The cliff of E. is
capped by a shale &
shaly thin bedded
lime estimated at
125 ft & then a cliff of
limestone much like
that of d & E of the Sullivan above
Estimated thickness
400 feet

Cut off by fault & erosion.

(Goes to 6) (7)

Fauna – Dicellomus ranges thru lower + 570 feet but above that only chips of trilobites were seen.

Capried Aug 29/20

a) Thin bedded, dolomitic coarse lms, in thin & alt chert & layers - & resting on massive bedded dolomitic lms ~~& [illegible]~~ 48 ft

St. W. 30° N -
Dip 20° S, 30° W,

b) Gray buff weathering shaly dolomitic lms. (Synthophlia) 65 ✓ 8 ft

c Gray ~~[illegible]~~ lms in thin uneven layers with arenaceous & ~~[illegible]~~ calcareous shaly partings - & layers of intraformational cong'l - lms. 18 ft

65 ✓ Fauna
65 ✓ Syntrophia
Gasteropod
Large Asaphoid trilobite
Tails & cheeks.

186
102

288
24

525

2

d) Calcareous shales
weathering gray (buff)-
with a few thin
layers of lime 6 2"
Fauna fragments of large trilobites

e) 9) Light gray calcareo-
argillaceous shale.
~~measured 18 ft (31)~~
+ stopped by cold gale

65 w/ + cheek spines of an
asaphoid trilobite -
Syntrophia
Eoorthis

with interbedded
gray intraformational
conglomerate layers +
shaly gray lime -
at 288 ft fossils occur
65 +) + fragments of a large
asaphoid trilobite occur
all the way thru the
section

528 ft

f. Calcareous shale,
gray & greenish mottled
thin bedded & slightly
gray lm. interbedded

83. 498

g. steel gray & gray
thin bedded fossiliferous
& thick Meadowood
calcareous shale.
Annelid trails V 252

h.) Shaly thin bedded gray
lm. Annelid trails V 40

i) Thin bedded dk
gray shaly lm. with shaly
partings V 314

~~Thin~~ Gray ~~t~~ Bedded ~~Blue~~ gray

slym with many

fossils — $\sqrt{}$ 6 ft

alberta

Siffleur River Aug. 20/20

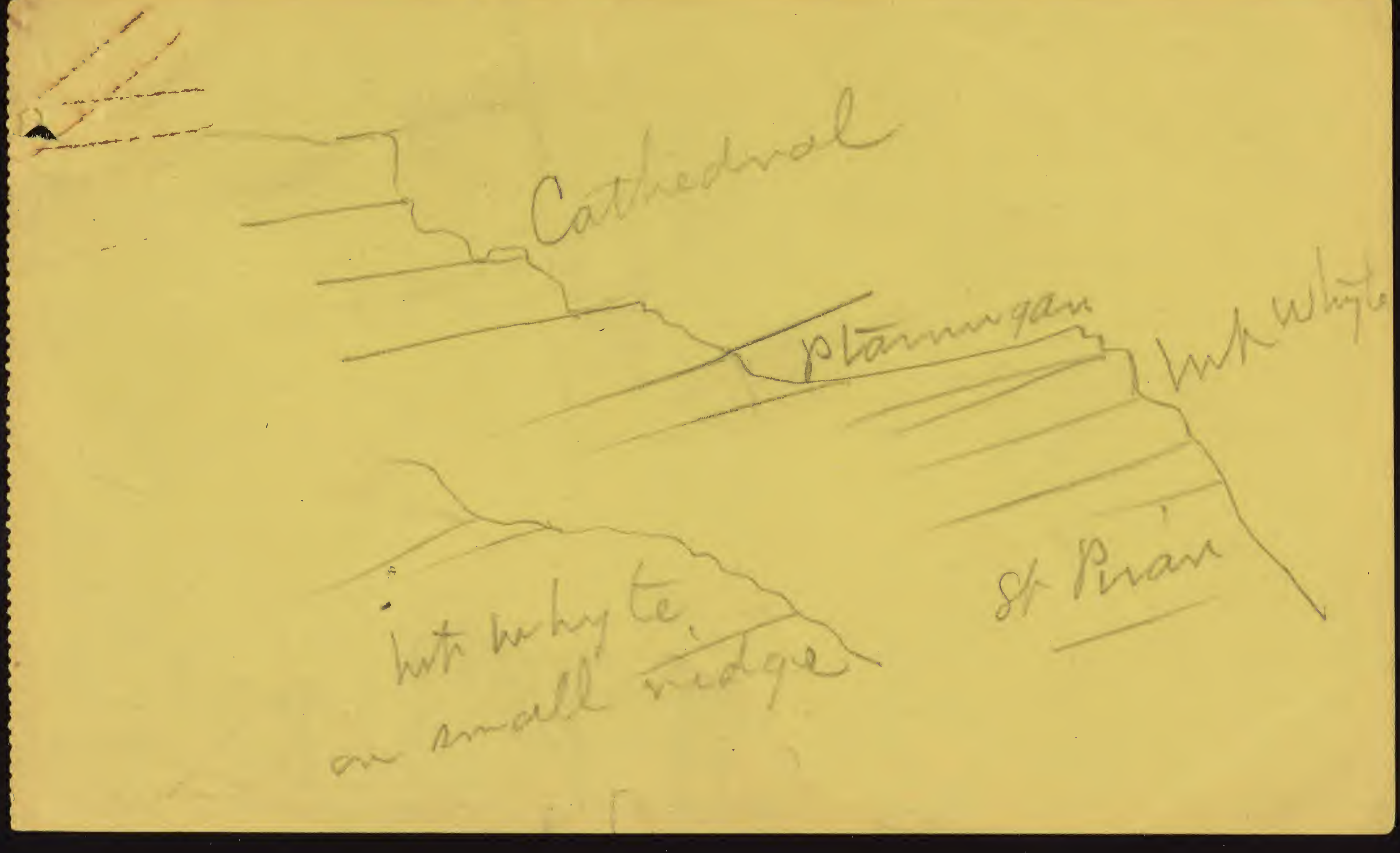
~~Sawback~~

Sawback — 3 mi. n. Pipestone Pass.

One of the best sections of the Cathedral Ptarmigan & Mt Whyte formations with the top of the St Piran occurs on the west side of Siffleur River canyon about 3 miles north of Pipestone Pass, It is practically all accessible except the upper silicious part of the Cathedral which forms bold cliffs headlands & fantastic domes & battlements —

(See on back)

Did not measure or study in detail.


Cathedral
Plannigan
Mt White
Mt White
on small ridge
St Piran

(Lyell formation). (over)
Section from base
of canyon cliff as
found 1200 ft east
of canyon three with
waters of Victor and
East Lyell glacier flow
at head of Glacier Lake
canyon valley.

1a massive bedded
gray siliceous lime
Layers become a little
laminated 84 ft (in
from the base & traces)
of trilobites occur. 198
1b at 198 feet same
thin rather soft
granular layers occur
with contain fragments of
small fossils. 4 ft

Gf.

1c
massive bedded gray
lim. similar to 1a.
with a band of

The Lyell formation includes the limestones from the Sulligan formation up to the shales & interbedded oolitic limestone of the Victim formation above.

222
180

42

82
492

328
240

568

540
160
570

1270

890
240

1236

of beds 40 feet from the base that break up into ~~slabby~~ more or less smooth slabby & shaly pieces on the surface of which graptolites occur.

(6) (4) (2) Total of 1ª 220.

Space covered by debris on line of section but with well exposed rock face on cliffs on mountain slope below & east of measured section 240 feet

---

~~Victor formation.~~

1ª massive bedded bluish gray limestone breaking down into thin layers & small

990.

11.

32.

4

256

240

496

492

988

540.

67. = 492

3

angular fragments on debris slopes. In cliffs this series is banded by buff weathering layers between dark gray bands. which become hard & massive at 328 from the base. At 496 feet from base the bluish gray massive beds that break up into thin very irregular thin layers are predominate for about 50 ft and then the massive, ~~gray~~ dark & medium gray lime with many thin magnesian bands continue up 490 feet.

Total 990 ft

Covered by talus 45 ft

Shale & lime of Victoria formation

38

14 - 84
39 - 234

To top of cliff 318.

23
1

184

5260
619
25
1386

- ptychoparia fauna (6yt)

Victor formation.

19) Oolitic gray lmu in layers 3 in to 2 ft thick interbedded in a calcareous-argillaceous shale - 185 ft

1b The shales become more calcareous & pass into thin layers of bluish gray lmu with thin layers of shale. The thicker layers of lmu also occur & large layers of oolite ... congl... at the a layer near the base is six feet thick & solid gray lm. 320 ft

1c 17) massive bedded gray lmu - with many ...

38 + 85

123
738

add to 1b
Fossils about 15
feet from base 24 of 1a
a thin 174 layer of
lime (2in) containing 39
many fragments 234 of
a large 970 Dikelocephalus
This about 150 feet
above Ptychoparia
+ Dikelocephalus bed
of 64.

2

arenaceous matter
that gives it a
slightly rough
weathered surface.

740 ft

1d
Similar to 1b

235 ft

1a
Fauna in thin
layer 12 feet from
base.

Ordovician

1a
~~2b~~ Thick colored argillaceous
shales, weathering buff
& yellow with inter-
bedded layers of hard
gray lm ~~distributed~~
irregularly in the
shale.

420 ft

1b Thick bedded bluish
gray lm. forming
high cliffs.
Est.

700.

Siffleur River
Pipestone Pass
1920

alberta

Sifflew River

~~Sifflew River~~ Pipestone Pass.

~~Copied~~

The Sifflew River heads on the north side of Pipestone Pass, 18 miles (Km) north of Lake Louise station on the Can-Pac. Ry. It flows north through a canyon ~~for~~ 22 miles & then turns to the west for 5 miles (Km) and joins the Saskatchewan river at the s. w. side of Sifflew mountain.

Dep 1st

At ~~the~~ Pipestone Pass the lower Banff lime. forms the eastern ridge down to the Pass, the superjacent Banff shale the western side up to where the overthrust Lower & Middle Cambrian strata form high cliffs that extend north

for 20 miles (Km) on
the west side of the
Siffleur river. On the
Eastern side the Banff
limestones form high
sharp ridges for about
20 miles (Km) where
the ~~Cambrian~~ Limestone
of Molde Cambrian rise
on a steep dip as a
high cliff facing
west & north across
the Siffleur (Creek). The
strata on the west
side of the Siffleur brake
fly on east & west
fault 20 miles north
of the Pass & dip
SW. Be as to make
Low and Siffleur Falls -
thus bringing the
lower Cambrian quartzite
in view on the western
end of the cliffs

and in the north
there is a canyon or valley
where a stream
flows to the Siffleur.

facing 1st Sifflem river
& mountain (1)

(1) Footnote. for p. 1

The Canadian land office maps show the Sifflem river flowing directly north to the Saskatchewan on the eastern side of Sifflem river but the river turns due west & flows 5 miles (Km) along the south base of Sifflem hill to the Saskatchewan river.

Geological Section

The ~~stratigraphic section~~ strati-graphic section begins at the Lower Cantinian ~~Spinnen~~ formation on the south side of the Sifflem river opposite Sifflem hill & extends north -

p 1bb

166

Geologic Section

The stratigraphic section begins at the summit of the Sullivan(1) (Upper Cambrian) formation -

(1) S - M. Coll. Vol - 1920 p. . (This the Expl Repts for 1919)

the massive limestones of which constitute high cliffs above the cliffs of the the Cathedral (Middle Cambrian) limestone below. The section terminates below in the quartzitic sandstone of the Lower Cambrian St Piran formation

Object of section. - The object of the section was to connect the base of the section at Glacier Lake with the known pre-

Upper Cambrian formation below. The Glacier Lake section terminated below with a reddish-black limestone referred to the Mercha formation of the Upper Cambrian the stratigraphic position of which in relation to the middle Cambrian was unknown owing to only a fragmentary fauna being found.

1c Aug. 14/20.

Sifflem River section.

Murchison formation

This formation was named in connection with the Glacier Lake section(1) but its thickness + base were unknown. It is now found to be conformably above the Cathedral limestone + to occupy the position of the Stephen formation of the Mt Bosworth + Mt Stephen sections. Only fragments of fossils were found in it 0. It has a thickness of nearly 500 feet but it is not succeeded by the great Eldon formation of the

(1). Walcott, S. M. Coll. Vol. 1920. p. . (Expl Pamphlet)

Bosworth + Id
Mfs. Stephen but by the ^ Arctomys formation
wh appears to correspond (in part) in character
with the Ghost River formation wh occupies
the lost interval between the Cathedral
formation & the Devonian. In the Sifflur section
the missing strata are the Eldon 2728
feet thick on Mr Bosworth.

Arctomys formation -

This may be the equivalent of the Bosworth formation in part especially as developed in the Glacier Lake section.

Sullivan formation

Correlated with the Pagett & Sherbrook of the Mt. Bosworth section.

7/24/21

July 24/21

Columnar structure in magnesian lime. at north foot of Oyster Mt. ridge – opposite outlet of Baker lake. 8.5 mi N. of Lake Louise station on C.P. Ry.

Thick beds cream buff colored magnesian lm.

See photographs

a = large columns 8" to 40"
in diameter –
b = small columns 4" to 8" –
c – Plain lm – no columns
d. large + very irregular.
Thin bedded gray mag lm.

In some cases columns may be formed

prior to consolidation as their shales overlay them. 

Columns from 20 in ( ) to 4.5 feet in length — smaller at base & expanding gradually.

See photo by M.V.W.

Some almost hexagonal as they press against each other

Mag- dam deposited as mud between separated columns.

Outcrop about 1000 feet & 10 to 25 ft high. Dip about 45° W.

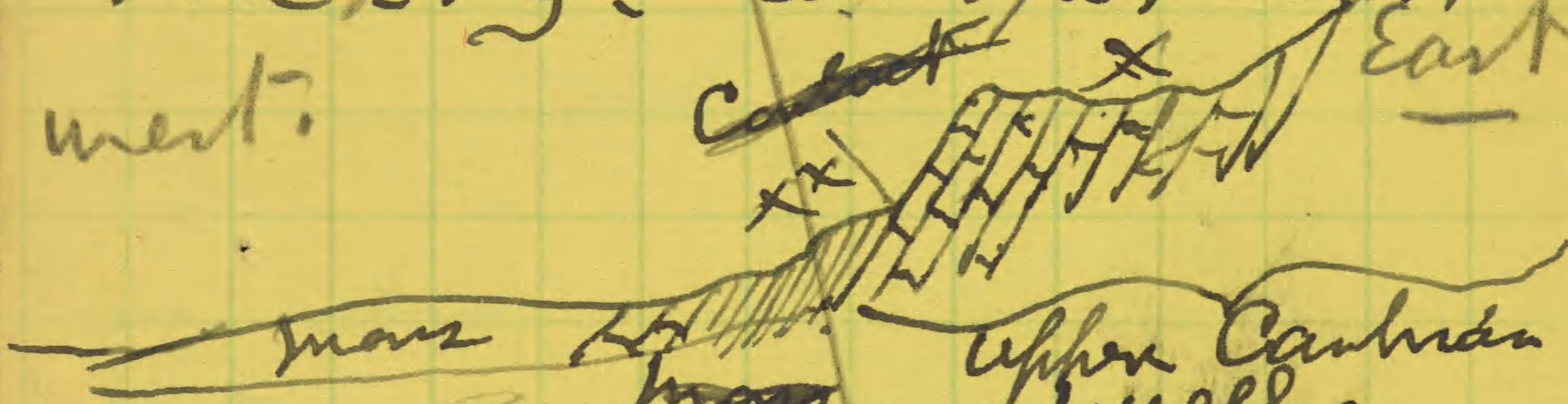
Columns vertical or oblique & bedding —

This structure should be compared with that in the Permian magnesian lm. of Tuttwell Hill yrameter, England.

14c, Aug. 27" 24

<u>Tilted</u> Falls.

Across upper Baker Creek Canyon valley, directly east of Brachiopod Mt & 9.5 miles (~~Km~~ 15.3 Km) east of Lake Louise station on the Can-Pac. Ry. Alberta, Can.



Strike of ~~thick~~ bedded gray & buff mag. lim of Lyell – N. 15° west. Dip – 60° west.

Silurian & arenaceous shales at x x'5th. a few buff layers 5 – & then mass concealed.

9/1965

Sept. 3 '25

Johnston Creek Pass — Wild Flower Canyon

Sarbach ~~mons~~ formation

finely exposed on north side of "Pass" ~~with Orkankis fauna. Becomes somewhat cherty near top.~~

Annelid limestone

1 Hard gray siliceous limestone penetrated with ~~strong~~ annelid borings & surface of layers fretted with trails that are preserved in chert & hard siliceous buff weathering lime 129 feet (?) in top ~~above the Mons~~ the base - Sarbach

stone formation · Mons formation

120 feet.

2

2 5 5
9 6
3 5 0 -

19 = 225 -
15 = 135
10 = 120 +
480

8 - 31 - 25 2

a lighter gray-rough weathering & marked by annelid trail & borings. 135'

Fauna 1b 69th

Worn section of a gastropod 3/4 to 1 in diameter Raphistoma-like - a few bits of trilobite test -

1a, Hard grayish black to dark blue limestone in layers 4 in to 1 cm with the same nodules & stringers of chert. a band of bluish gray flamiliferous limestone, about 4 to 6 in thick occurs at 96 feet from the base. The above mass at 455 feet formation r - the beds are upturned

~~18~~
104

3

distorted, crumpled
+ broken up ~~on the~~ beside
~~approach~~ the Johnston ½
~~Canyon~~ Wild Flower
Canyon over thrust
fault. See figs —
section + photos —

Fauna. 69f
Receptaculites —
Obolus — Eoorthis —
3. sp. — Trilobites
heads —
Lower Sarbach
fauna but not
same as at Fossil
Mt — (69a)

At, 455 feet from
base a small fauna
occurs in a bluish
gray half nodular
lim. 69g

8/1925

(1) ~~Aug. 5" / 25~~

Sarbach - Tunnel Mt. Going up

1) St. N. 40° W. dip 40° W. mag.

(2)

Gray lm. in layers 1/2 to 3' thick breaking up into irregular fragments & weathering into fine, coarse slabs 64 ft + 41' 105

(Fauna 69 ft) 30 to 50 feet above base

(6) 2) ~~Hard gray lm. with finely crystalline structure layers 12 - 24" & breaking into thin irregular layers on weathering 86"~~

5/3 2 (2

3. Thick layers
5 3 to 5 feet of fine
mag. lm. with a few
thin irregular hard
~~layers~~ - bluish gray
lm. layers & also nodules. On weathered
surface the mag. lm.
weathers rusty buff
brown & the lm. gray
wh. gives a banded
appearance. The gray
lm. weathers more
readily wh. leaves
the buff mag. in
relief. 36'

18 feet from base one
of the softer gray
layers carries many

fragments of trilobites Lck, (21E) The fossils are in a band of thin irregular layers about 6" thick.

(A) 4) Massive bedded 2' to 6' light gray slightly arenaceous lm. 66'

Annelid trails & borings & Receptaculites etc.

(B) 5) Light gray - very fine (sl lines) with thin clay or nodules of chert in layers. Chert is rather tuff. 42'

63
378

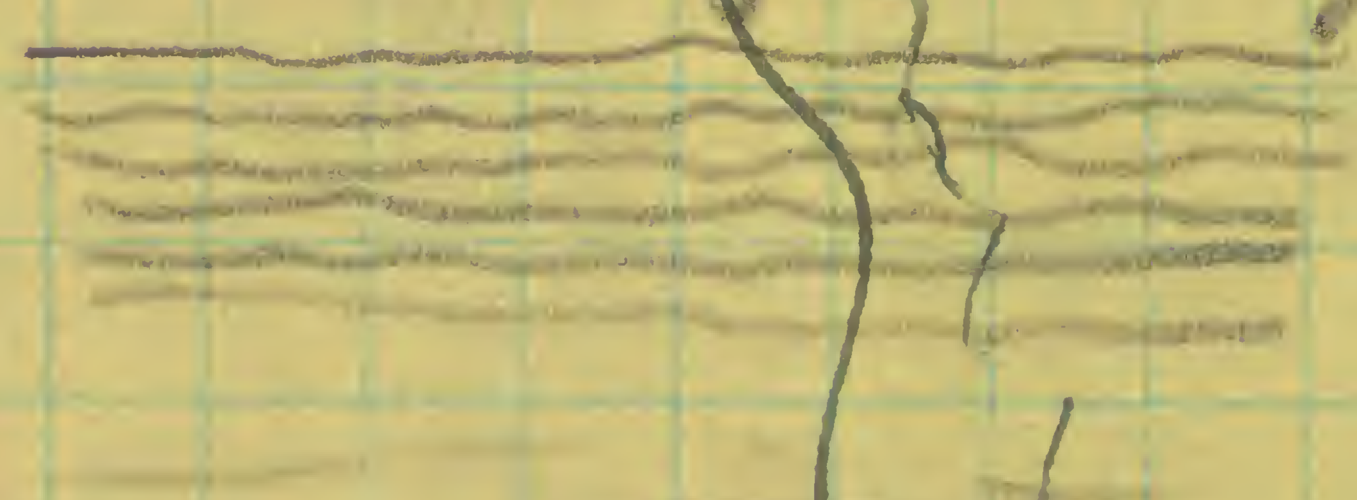
(2) 6 - Similar to 4, 12'

(1) 7. Similar to 5, 380'

Dark Devonian shale -

Going down -
No. 8 -
Gray limestone
somewhat similar
to 7 but more
compact & breaking
down into thin
layers & angular
fragments, on weathered
surfaces the face
(Fauna, 21x)

of the layers are
banded with thin
buff colored magnesian
layers 1/4 to 1/2 in thick
(? in) Irregular



24 feet

Fauna (21 ft)
Graptolites
Etc

No. 9. Thick
bedded gray lime
similar to 17 but
more compact
126 +
at 126 feet
from top a few
layers of hard
bluish gray lime

occur an thicken-
ings of the many thin
layers alternating
with the buff
weathering thin
layers - In these
bluish-gray layers
fragments of trilobites
occur along with
archaeocyathid like
forms - [illegible]
69C (125 feet -m)
from base.

No. 9. Going down
125 feet measured.
20

Total 175

10) Dirty gray
friable arenaceous
lime with thin
steel lis interbedded
layers of
gray shale also
nodules & stringers.
Lime weathers
dirty gray & buff
gray & often dark
rusty brown 95'

Fauna assembled
Snails & borings

بعد

2 –

11.) Light gray compact lmst in thick layers 15 to 30 cm) thick

with considerable cherty matter in thin irregular often in osculating lamellae small nodules & thin layers – In some ledges there is so much cherty that the weathered surface is dark rusty brown. The gray lm thickens in places & forms most of a layer.

at 70 feet below top of 111. a thin layer containing fragments stromatolites

Loc. 69d)

28
2 28

119 Card (mp) (3

at 140 feet from top a thin black gray layer yielded the following

Loc -

(298)

from a similar layer 175 feet from top gave a fauna -

Loc -

Concealed by debris 60' 0

Similar to strata above. 8'

---

11. Fine grained, dense

18
108

colored in thin
even layers that
form 1 thick
layers 2 to 4 feet(
m) thick. 14' c

11c Similar to 11a
with fragments
of [illegible]
Locality 48' C

305

12. Steel gray
magnesian lm
in thick layers - 110'0

Ozarkian

Mana formation

a Gray & dirty gray
limestone in thick
layers 2 to 4
feet (m)
weather light

gray [a little
chalk] occurs in
irregular & angular
pieces scattered
without special
arrangement
in many of the
layers.

Measured down
150 feet (m)
to the talus. Noted
section of small
gasteropods &
brachiopods.

not unconformity
noted between
Laubach &
Muns.

Aug 28/24

Cirque

2 Aug 1924

Filled mt. Cirque

Tilted mt.

Alexander

Gray mud rock

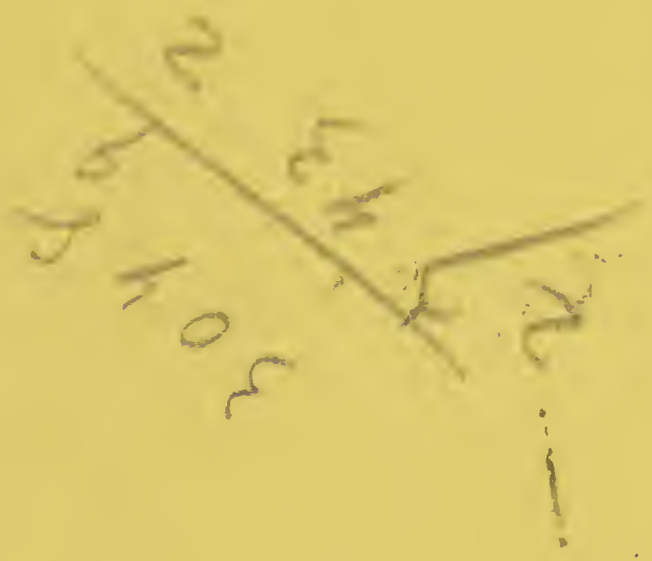
shaly-sulphur mud cracked

Lower Cathedral Lyell Fm

Lyell

Lee photos of M, V, W

Looking south + S-E-



Main Plan of
Cattan Spaces of
Cirque.

Cotton Guard Cirque

marine bedded dark gray lime

Fault line

Buchanan

Bosworth

Lower Tyell

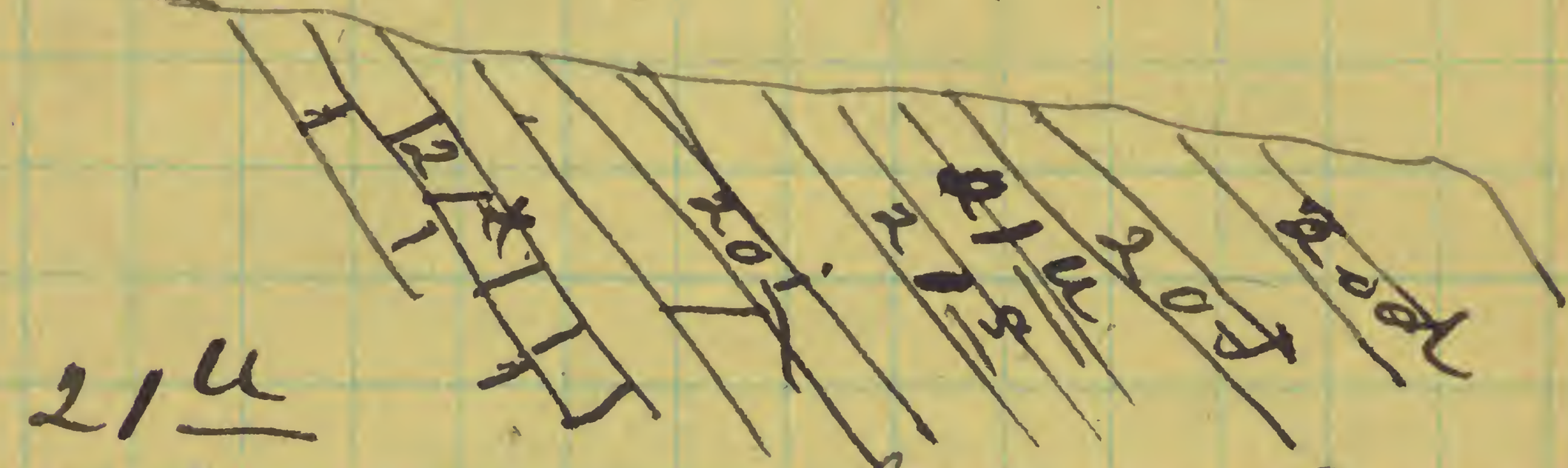
Thick bedded Tyell

Swans valley

35
2/0

7/1925

Filled Mrs. Brook,



2 1/4
2 1/2 in 10 feet above
2 0 i
the collection of 1924
from 2 1/2 i. may include
more or less from
2 1/2 s.

2 1/2 6 feet above base

Add to sketch of
receivers in Fig. Penfield.

Tilted Mt. Brook. (1)

7-24-25

a a

Brook Col.

At (a) Argillaceous shale with thin layers of flinty gray compact lime occurs in contact with the dark jointed rough weathering magnesian lime. Where the track plans over the latter there is a slight bend or curve at the strike which

Bank

causes the softer beds to swing more to the west. It may a little displacement as the thinning out

a 13
h c 2.3
d 2.
ε 17
f 3.2
37.5

to the north of the shaly beds.

Shale & lm

Mag. lm

~~On north side of bank~~

Section of 1st of 1924.

a) Thin bedded bluish gray lm. interbedded in gr argil. sh. 18 feet

At 6 feet (m) from base a compact gray lm. carries a few specie Loc. 21E
on north side of bank

b) Gray, hard lm with some yellow weathering irregular streaks. 9 in to 15 in

c) Shale & very thin layers of lm. similar to a. 12 in

d) Thick layer of lm 3
similar to b. 16 in to 24 in
Fauna. Loc. 20i

E. Thin bedded bluish gray lm with parting of argl shale & thin shaly lm. 17 feet

f. Lm - similar to (b) 38 in

(Fauna. 21 S near base)

This stratum of gray lm is composed of 3 more or less irregular layers of slightly irregularly bedded gray lm. The upper layer has considerable Stromatoporoid like structure and all the layers have bits of the lime-stone

scattered irregularly
through it which
gives in places an
interformational con-
glomerate aspect to
the rock. In places
the lm weathers to
a yellow buff color
indicating magnesian
content similar to the
magnesian lm layers
beneath the 1st
Fragments of trilobites
are scattered in all 3
layers & most abundantly
in the lowest one.

g 1m Similar to E. 21'
h. " " F. 3 p in
Fauna 21 E
i Similar to E. 19 ft
~~numerous fragments of trilobites~~

5

j. Similar to f 4' 6"
Numerous fragments
of fossils.

k. Similar to i

l. " " j but 5' 6
(1 lm) Smith bottom
layer 4 ft thick.
Middle " 1 " 4
Upper 3 " 0 8' 4

m. Gray fine grained
magnesian lime in
layers 2 to 14" thick 4
1 + 1 1 1 - 1 5 8

Upper Cambrian (?)

Lyell Formation -

Upper Fossiliferous beds
exposed by brook
channels from Tilted mountain
Cirque on northside
of Tilted Mt -

The
Lone formation is in
floor of canyon
valley S. of Baker
Lake - from mouth of east
side * north of Tilted Mountain

Lyell - (Summit)

1a Gray, hard arenaceous
shale with intercalated
thin layers of arenaceous dolomitic
limestone 15' 15' ?

1b Thicker bedded, -
hard, rough weathering
gray & buff dolomite

(1) Aug. 28 - 31 '24

Tilted Mountain Cirque section -

This section is essentially the same as that of Cattan Grand Cirque 1.5 miles (Km) to the north at the south end of Oyster Peak ridge. Only the upper fossiliferous portion of the Lyell formation was measured as that part is not well exposed in the Cattan Grand Cirque section where the entire thickness of magnesian limestone is 29 (m) in thickness.

The Tilted Mtn. upper Lyell section supplements the Cattan Grand Cirque section -

limestone. (3) ~~Littel Mtn~~ 115'

1 c Light gray thin bedded, some what flat irregular limestone 16'
Fauna. (Loc. 20d)
Large Saukia etc.
Leave 6 line space

1 d Thick bedded, buff magnesian limestone similar to 1 b 62'

1 E ~~Arenaceous~~ shales with thin layers of dolomitic & a few gray limestone 45'
Fauna
Saukia (Loc. 20 J)
(4 line space)

1 F. Thick bedded buff magnesian limestone similar to 1 b & 1 d 58'
Fauna. At 30' (m) down the upper surface of a thick

layer (3 feet m) is
covered with the ends
of a columnar species
of Cryptozoan. Collenia similar to
that at the same horizon
15 miles (Km) to the
north. (See photos & notes of 1921)

1g. Arenaceous shales with
thin & layers of
flinty-gray limestone 6'

1h Alternating layers of
of hard gray & dove
colored limestone with
numerous small flattened
& irregular nodules of
limestone - 5'10"

1i Similar to 1g- weathering 18'

1j Similar to 1h " 3'2"

1K Similar to 1g " 16'2"

5.

1l. Similar to 1h (Copy 5'10"

1m ~~Shales~~ Arenaceous & dolomitic shales with thick layers of hard gray limestone with many small irregular & usually flattened concretionary ~~or~~ mud lumps, also a band of thin bedded gray fossiliferous limestone 38'.

Fauna. (Loc. 20v)

This a prolific locality for drakers up trilobites. Small Saukia etc.

Leave 10 lines space for list.

Beneath 1m thick bedded buff & gray magnesian limestones extend down as in the section at Cotton Grass Gorge to the north. These ~~strata~~ beds dip 40°

west with a strike of
north 15° west.

This section is the only
one found where the
great Lyell limestone
is fossiliferous. In the
Clearwater, Glacier Lake
and Ranger Canyon sections
the ~~Beds of~~ magnesian
limestones extend from the
shales beneath to the
base of the bluffs in an
unbroken series. The
lower shales carry a well
marked Upper Cambrian
fauna from 1200' (m)
to 1400' (m) above the
base. This fauna is very
abundant in the shales
above the Lyell.

The fossils of the Tilted
Mountain Brook section appear
to form a transition series

between the [67] Upper Cambrian
Lyell fauna & the
Bricola fauna of the
lower Mona.

At Loc. (Loc. 20d) in
1c of section.
70 feet below Loc. 20d
1E of section
120-150 feet below
Loc. 20f, 1m of section.

Study & compare with
lower Mona fauna
of Clearwater & Sinclair
Canyon sections.

7/1924

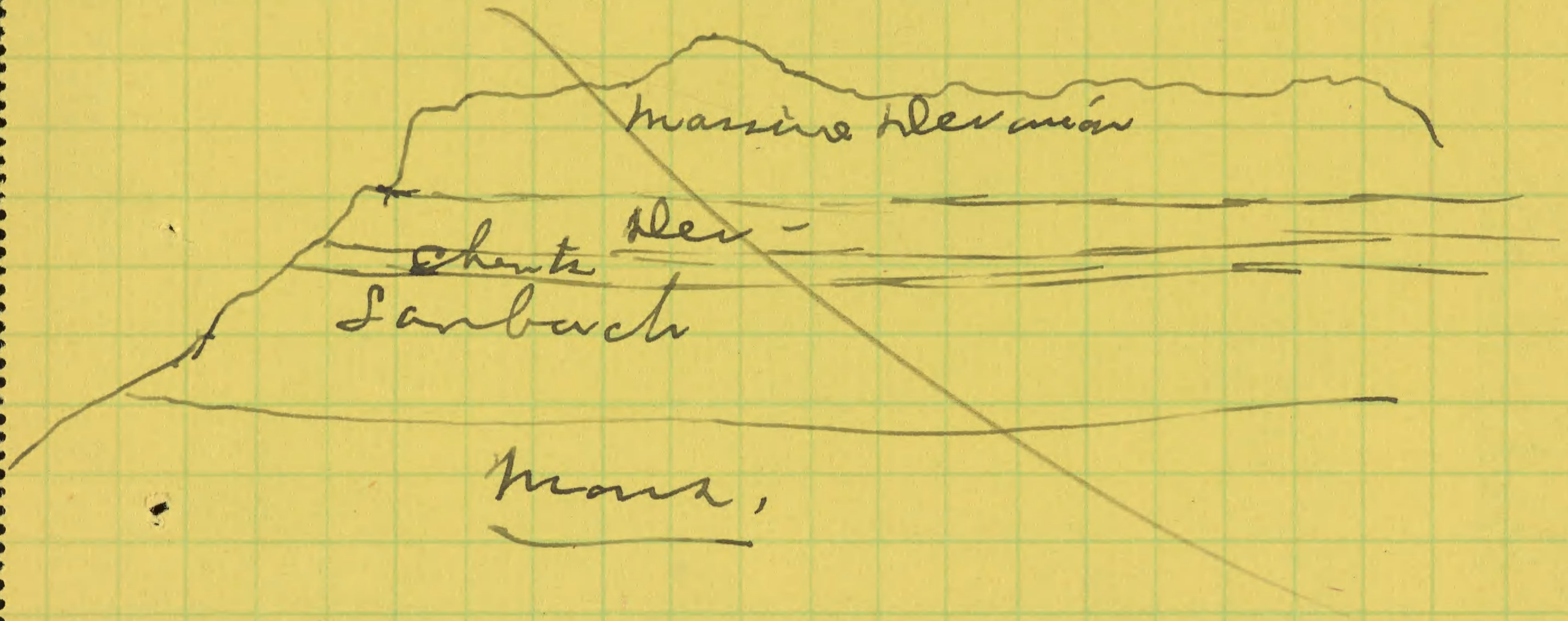
Fossil Mtn July 30 1924 —17—

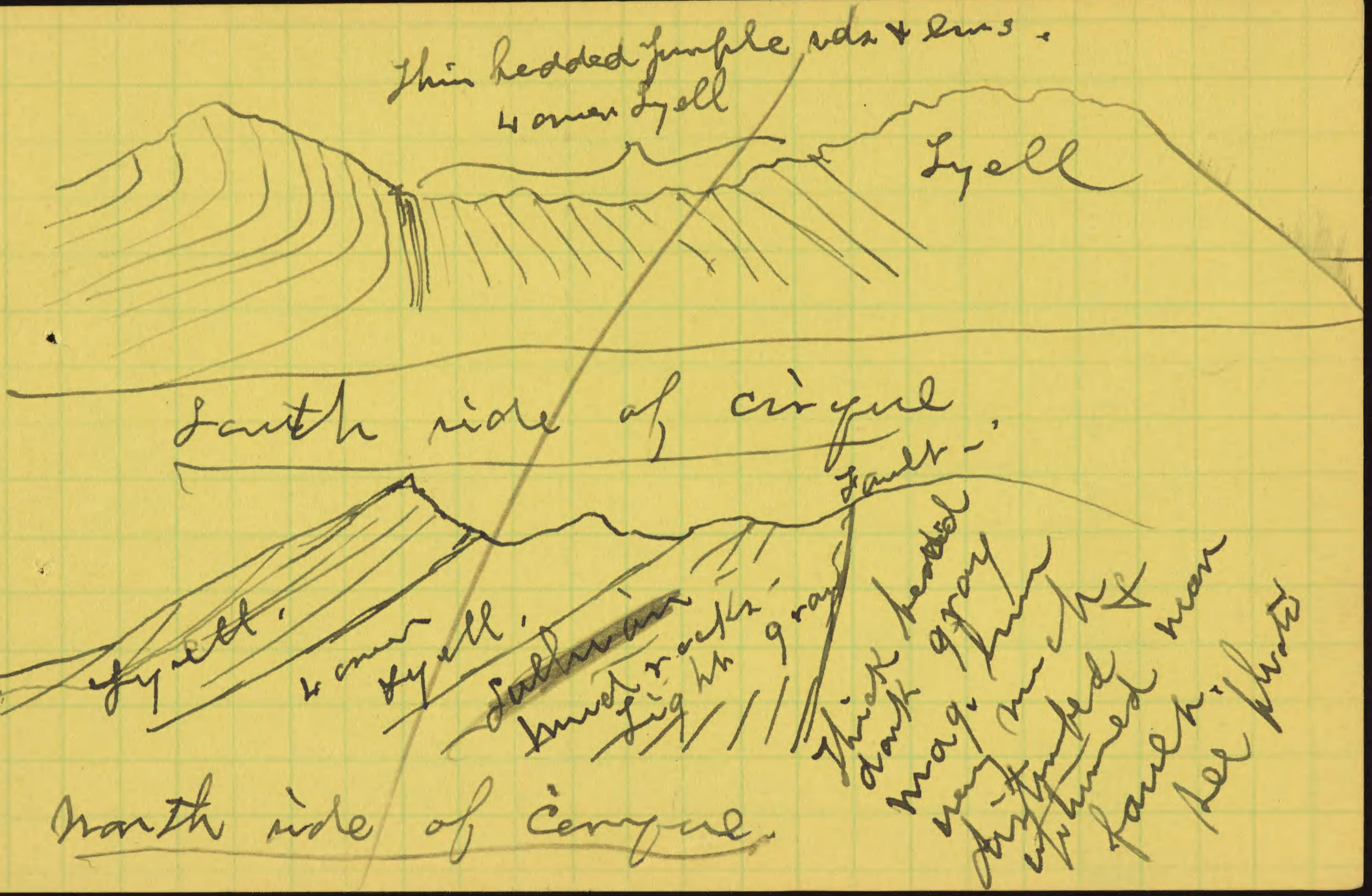
Loc. East slope of Fossil Mtn.

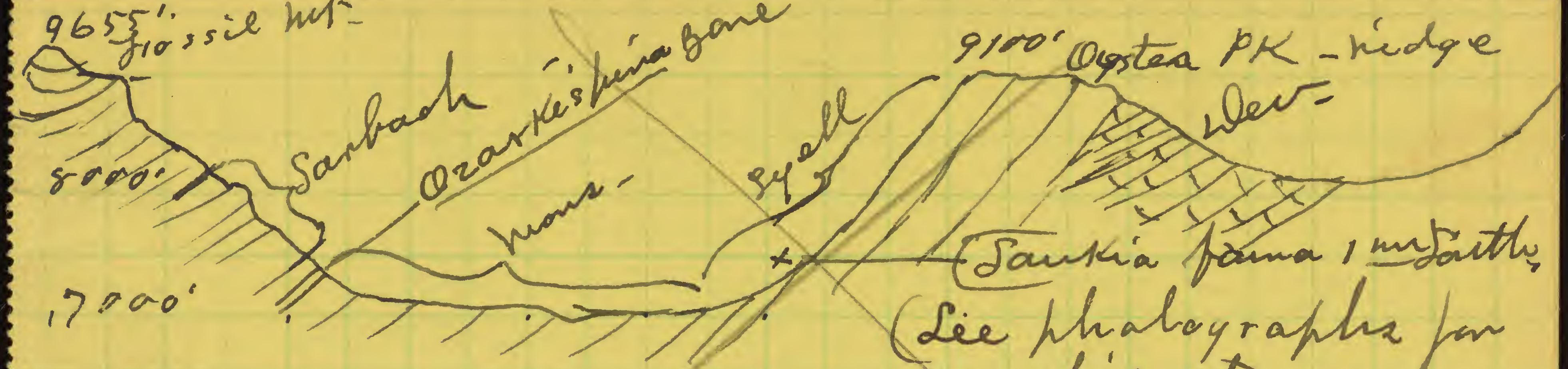
The upper thin to grey thick bedded limestones of the Minnewanka — are more or less irregularly changed into a buff colored magnesian limestone. The face of the layers where exposed shows the alteration

all gray & fossiliferous

Aug 25th/24. East face of Grant Mtn.
4 x 5 See photos




Thin bedded limestones & shales.
Lower Lyell
Lyell
South side of circue
Lyell.
Lower Lyell.
Salmon
Lyell
Fault.
Thick bedded dark grey
Fault.
Thick bedded dark grey
North side of Cirque



Sketch section from Fossil Mtn east across Deride valley to Oyster Peak ridge.

Deride valley takes its name from the broad flat Deride between Red Deer River and Baker Creek.

(Logo in Fossil Mtn section)

1.609
1
1.47 8
2 5
3 2 8 1 8 0 4 5
.40

7/1921

(1)

~~Fossil Mountain July/21/1920~~
~~9 mi N.E. Lake Louise station on C.P.Ry~~ ~~valley to east~~
~~Section on east slope.~~

The Devonian limestones forms the upper portion of the mountain the strata dipping about 30° west 30° S. (magnetic) lc

No ~~apparent~~ Disconformity physical disconformity exists between the Devonian ~~the beds beneath. The Devonian is a series of~~ (roughly weathering, dark lead gray limestone carrying numerous corals + stromatoporoids of Devonian age + the subjacent strata.

side heading: Ghost river formation. lc

Beneath the Devonian there is a series of thin layers of magnesian limestone with layers of chert one to two inches thick

(over)

which may be between the layers or a part of a layer. The massive dark coarse Devonian limestone above and the light gray relatively soft Ordovician (Sarbach) limestone beneath these cherty magnesian beds ~~clearly~~ define the latter as a formation ~~deposits~~ unlike either and are deposited under dissimilar conditions. (It is) clearly the representative of the Ghost River formation of the Ghost River section.

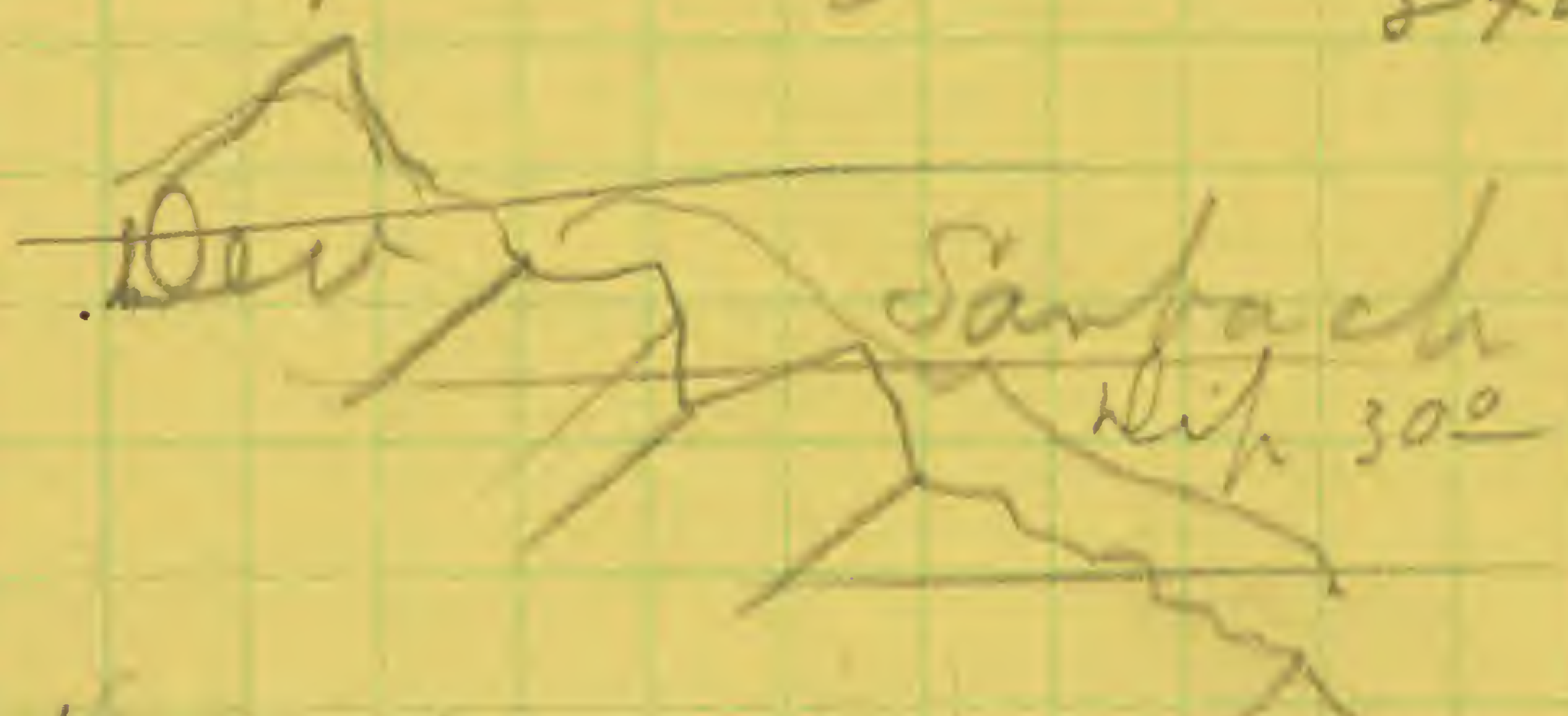
35 feet

2) Ordovician s. c

3) Sarbach formation.

1a Thick bedded gray limestone weathering light gray — passing down into massive bands of gray dolomitic limestone that forms two high cliffs on east front of mountain

840 ft —



1b Light gray magnesian limestone in thin layers with a few irregularly alternating ~~thick~~ layers 1 to 3 feet in thickness

Sr. N 30, W. dip. 30° W (30° S (magnetic))

(147 ft)

2a

(Sanbach Cont'd)

1b Light gray magnesian limestone, with nodules + stringers of chert, 58 ft

1c Thick layers of cherty quartzite ~~that~~ breaks down ~~in~~ conchoidal fractures into small fragments. 48.

Total Sanbach — 1090 -

The upper 840 feet was measured rapidly + may be in error 50 feet either too much or too little. Only a few ~~undeterminable~~ fragments of fossils were observed.

2) Upper Cambrian.

3) Thorntown formation.

1a Light gray, thick bedded limestone with bands & lenses of calcareous shale. 32 ft.

Fauna.

From 10 to 30 feet (3 to 9 m) below the top several layers carry fragments of trilobites & a few traces of small gasteropods & numerous specimens of Syntrophina (Sec. 66a) (Trace 2m) at 255 ft (78 m) from the top a strongly marked fauna (66a) occurs in a number of layers.

Fossils -

3) Dikelocephalus.
Ptychoparia -
Plasura -
Sanctia -

(Trace 2) many gasteropods

350,

54

58

6

348.

1b Limestones similar to those of 1a but thinner layers & interbedded with thicker bands of shale - the shale predominating. 355 ft

Total mass formation exposed. 675 ft.

Fauna.

At 95 feet from the base a small fauna occurs (66 f.)

The lowest beds exposed carry a few fossils (66 f) are on back.

Alternation of shale and thin layers of magnesian limestone occur in the stream channel at the bottom of the broad canyon valley but most of the section is concealed by ~~the~~ glacial deposits & wash from the mountain slopes. On the east

The fauna is essentially the same throughout the 675 feet of the Maus formation exposed in the section. Numerous small gasteropods and brachiopods predominate along with fragments of trilobites.

side the hard limestone of the Lyell formation form a high ridge that abuts against the massive limestones of Mount Douglass. The important contribution of this section is the presence of the Sarbach formation which has such an important development

18 miles (air) north of the head of Clearwater river canyon.

Photo + Sketch of Mt to go in here,

New page next.

Ghost River 9/1921

Mt Wilson 6 Sept 21

Saskatchewan Series 6/2

Shash River Interval
at N. W - end of Mt.
Wilson on each side
North Fork of Saskatche
wan river South & nor
(Km) from its junction
with the west Fork.

Deer Canyon Sile

Santach -

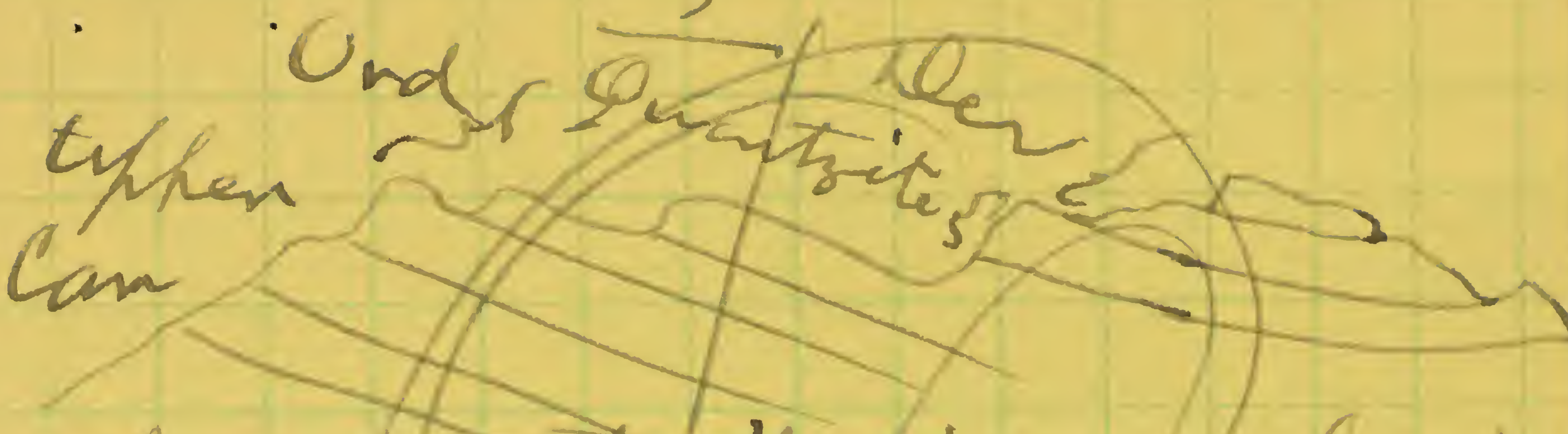
Upper Cantras

The Shash River formation
is represented by a
massive white quartzite
that forms a bold cliff
at the top of the great
cliff on the South side
of North Wilson mounta
in, a strip
half a from miles
north of the highest
point of the mountain.
This quartzite thins
gradually northward

until attained the
zenith of Alexandra
River where it is
met over 100 feet (m)
thick & trends further
south it can only
be distinguished by
a few thick layers
beneath the black
Devonian limestone.

On the south side
of Mt. Wilson facing
the Saskatchewan
river the quartzite
(Wilson unit) can
the eastern half of
the high cliffs but
this is dropped from the
western half.

[illegible]
has been
removed by erosion



The quartzite is overlain by dark Devonian lime-stone -
(See M.C.W. photos of Mt Watson)

Ghost River interval. Sept 17th

Mount Murchison.

The quartzite ~~of~~ Mt. Wilson ~~also~~ occurs ~~on the~~ in northern & west side of Mt. Murchison. but it is not as thick as on Mt. Wilson & also thins out on the N. E. side of Mt. Murchison.

as far as was known the

~~The~~ Mt. Wilson quartzite originally covered an area with a major axis of ~~about~~ 20 mi (km) in a N.N.W. by S.S.E & a minor axis of 6 mi to 8 mi (km) as indicated by present outcrops + It was as deposits of ~~sand~~ fine white sand in ~~along~~ the shallow sea

sea that preceded the Devonian coral reefs & black calcareous silt in which they were embedded.

The question of calling all the deposits in the Ghost River Interval the Ghost River formation (Wagnerian Intermediate) of Ghost river. Quartzite of Mt. Wilson should be placed before the Committee on Geol. Names of the U.S.

Ghost River Formation.

Insert here the locality from p. 2

Name proposed for the 285 ft (m) of magnesian limestones between the Middle Cambrian limestones (Cathedral formation) and the superjacent Devonian beds (Intermediate limestone McConnell).
These 285 feet of beds are a very conspicuous ~~formation~~ cliff on the summit of the cliffs for many miles along the Rocky Mountain front, from the South Fork of Ghost River north to the Red Deer river; they also are the only representative ~~of the~~ of 22,500 feet (m), of strata that occur in the Kicking Horse Pass section to the

Ghost River. 2

(between the Cathedral line westward & the Devonian) No fossils or traces of life were seen in or on the rocks of this formation.

Type locality. Tr. p. 11

First small canyon south of Ghost River canyon and opening on Ghost River as the river bends to the south.

At the Devils Gap about 2 miles south the formation dips westward & disappears about 1 3/4 mi E.N.E. of the Eastern end of Lake Minnewanka.

about 51 miles west 20° north of Calgary Alberta Canada up

Hyz
Last interval between
Middle Cambrian and
Devonian which
this is represented by
285 feet of magnesian
limestone & shales & layers
which rests conformably
on the Cambrian & which
there is almost a gradation
between the two
except that the gray
thin bedded limestone
of the Cambrian are
that repeated above the
shaly magnesian lm's.

The strata that occur
in the Kicking Horse
Pass section between
the Middle Cambrian
Cathedral limestone &
the Devonian include
Silurian 1850 ft

6 Ford 1850
7700.

Ordovician.
Upper Cambrian.
Attenbacke lm 1725.
Chancellor 4500.
Sherbrooke 1375
Paget 300
Bosworth ~~1855.~~ 9755

middle Cambrian
Eldon 2728
Stephen 640 3368

22.673

The last interval
was one of nondeposition
as there is no evidence
of erosion along the
several miles of exposure
of the contact between
the Magnesian
limestone of the Ghost
River formation &
the Cambrian beneath
& the Devonian above.

SU. of C.

Sullivan Peak
~~Glacial lake Canyon~~
Valley

Then back going down

1a Massive bedded gray Spindagen lime beneath bluff weathering thin bedded gray clayless layer of lime of superjacent formation. 20 ft

1b Massive dark gray very finely ~~arenaceous lime~~ that breaks down into thinner layers - 95

1c Bluish gray lime in thin irregular layers 105

64 ft at base

Flathead shale formation at base of 1c

Head of Ptych.? at top

648

(D)

The canyon valley in which
Glacier Lake is ~~situated~~
is about 5 miles (Km) in
length east of
~~at~~ the foot of East
Lyell and Victor
glaciers which extend
down from the
Continental Divide
about 50 miles (Km)
n.w. of Lake Louise
Station on the Can.
Pac. RR. High ridges
rise from 2500 to 3500
feet (m) above the
Lake & canyon bottom
[illegible] on the south
forming front of the
Mt Forbes mass[?].

2. ~~Ap. 10/19~~

~~Glacier Lake section~~

~~over 14~~

The section begins below [the front of] Victor ~~peak~~ & extends down [over] the cliff on the [N.W. 132.] side of Victor Glacier to the cliff at the foot of southeast Lyell Glacier then with the stream from Victor Glacier passes through a narrow canyon. The ledges forming this lower cliff are well marked on both sides of the upper Glacier Lake Canyon valley rising from the foot of the glacier at an angle of 15° & continuing to the top of the ridge on the North side of the canyon where the section was measured;

~~the~~

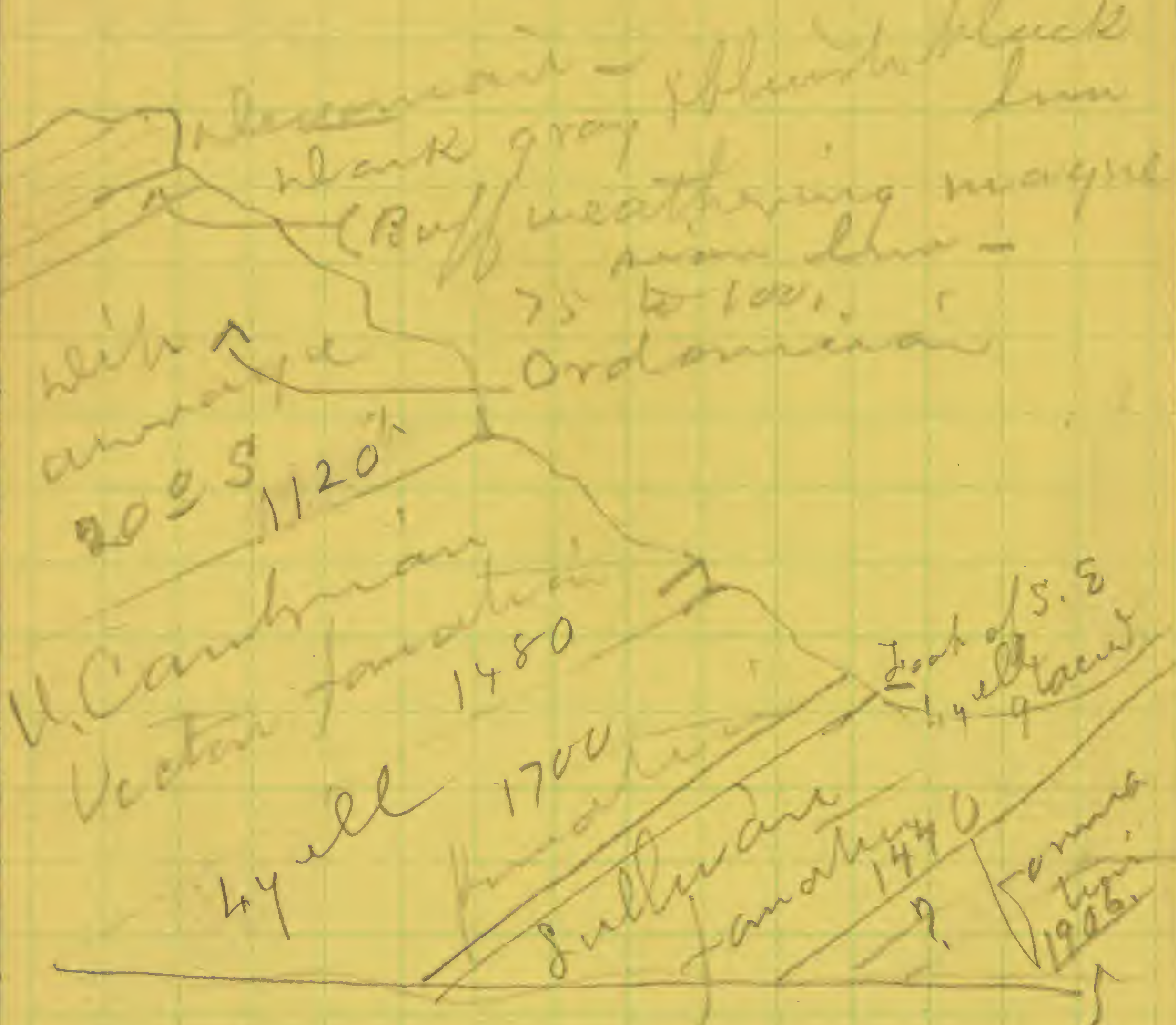
The cliff is divided midway by a ~~thin~~ band of thin bedded limestone wh forms ~~a~~ a narrow terrace between the upper & lower walls, wh are each about 200 ft. high. Below this cliff the shales of the Sullivan formation form a slope that is usually covered by debris from the cliffs above or by a forest of fir, spruce & ~~[illegible]~~ pine.

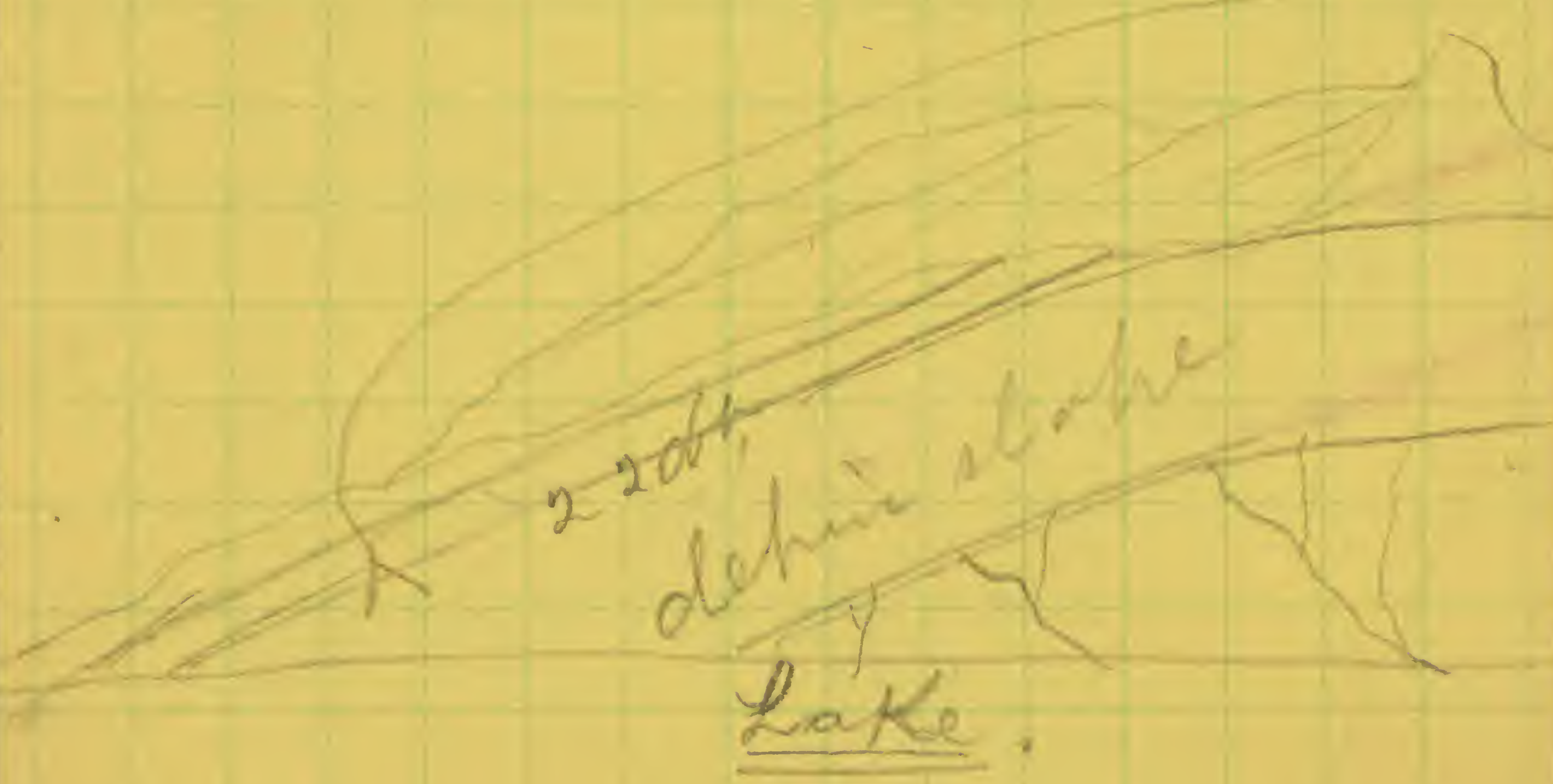
The section continues down thru the Sullivan formation [illegible] the limestones of the formation wh form ledges about the north height of Glacier Lake

1a

and those on the north lead off the Surrey & Sullivan Peaks. The canyon is graded up with gravel & debris brought down by the glacier from about 2 miles (Km) above its upper end, & the lake occupies the lower 3 miles (Km) of its length.

Over to 2 + 2a


[illegible] – flinty black lime
dark gray
(Buff weathering magnesian
[illegible] lime –
75 to 100'.
Ordovician
with [illegible]
2025
1120'
U. Cambrian
Victoria formation
1480
Lyell
1700
formation
Foot of S.E
Lyell glacier
1.4 9
Sullivan
formation
1470
?.
formation
1906.

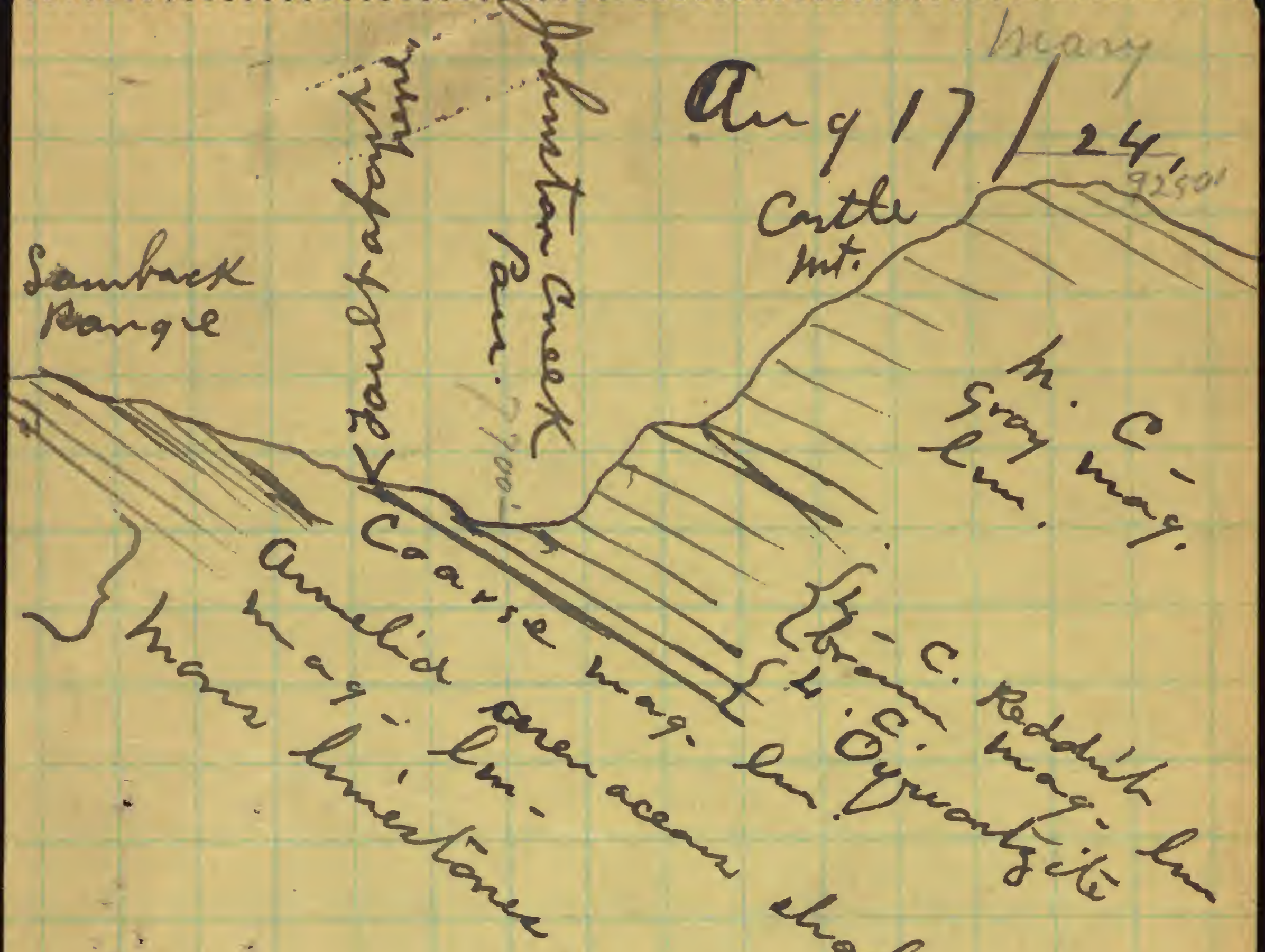

2 20 ft,
debris slope
Lake

116 -

120.

780.

986



Looking south at Johnston Creek & Wild Flower Canyon Pass. North spur of Cattle Mt. on right. Overthrust fault - ~~of~~ (Pass) (to left of Ozarkian (mass) & slope of western ridge of Sawback Range on left (northeast) of fault.

Mons Aug 14/12

N E slope of
Fossil mountain
going down,

1a Grey thick bedded
siliceous & magnesian
limestones with
considerable cherty
matter in thin
stringers & replacing
fragments of trilobites
66 ft (m)

670 | At 17 feet (m) from
top numerous fragments
of trilobites & a
rather large species
of Eoorthis.

Leave 3 line space

1b Gray limestone in
thick layers 15 to
24 in (cm) thick

66
205
083
57
33
444
150

2

~~that~~ break up into
their irregular layers
on weathering also
into small irregular
rounded fragments –
~~Ck 9~~

205 ft (m)

67ft at 96 ft down (m)
large Asaphid trilobite
occurs – + fragments of
trilobites

3 line space

1c. more massive bedded
hard gray limestone 83 ft

1d. Bluish gray thick
bedded limestone
with considerable
chert in thin
layers + stringers

57 ft (

1e. Massive bedded
fine grained, buff
weathering magnesian

17
85
97

limestone. 33 ft

Fauna (O.V.)

graptolites

Obolus

phyllograptus

Ophileta → fragmentary

trilobites

Leaves

6 Dendrograptus

occurs in upper portion.

ft. Gray limestone in thick layers weathering bluish gray & breaking down into thin slabby layers — 150+

Fauna — At 97 feet from top of ft. ~~the~~ Ophileta ~~Dan...~~ occurs in bluish gray limestone. ~~as~~ as ~~at locality 66~~ seen in sections of coils.

Section here ~~covered~~ concealed by debris of the bottom of canyon valley.

9/1919

Copied

Glacier Lake section

Sept. 3/19

Loc

One (1) mile (km) below foot of East Lyell glacier on north side Glacier Lake canyon valley on south slope of Sullivan Peak. in ravine with small rivulet.

at base 2nd of Sherbrook formation (Walcott 1908) p. 205)

1. Greenish drab & gray siliceous, & argil shales with interbedded, hard, compact buff weathering, gray lime in thin layers at the base.

(St-N. 30° W. Dip. S. 30° W. 15°) at about 25 feet (m) a massive bed of hard argil & sil purple colored shale

continues on up along the west side of the canyon.

22/ 8 ft (C m)

1m

1a Thick layers of dolomitic calcareous compact fine laminated limestone 12ft (m)

1b Purple shale with some greenish & red calcareous shale. 17ft

1c Similar to 1a 13ft

1d Greenish gyl shale checked by mud cracks. 8ft

1e Similar to 1a Layers of trilobites & broken up shells. 51"

1f Greenish sil sh. 11"

1g Similar to 1a 5-2"

1h Greenish sil sh 9"

Add to 1a

This limestone & similar bands above appear to have been a calcareous slime spread rather slowly & evenly ~~in~~ very thin layers. It is much like a glacial mud –

16
80,
90

24
120

11,
1

1i Similar to 1a 136 ft.
three bands of
ferruginous. sandy
lime ~~about~~ 1 to 2
feet (") occur ~~in~~
~~t~~embedded in the
lime -

1j Purple silt sh-
that passes by
gradation into the
lime stone of 1i at the
base & alternates
~~at 62 feet~~
with greenish, sh &
hard gray finely
grained lim. 90 ft.
at 62 feet the
greenish gray arena-
ceous shale contains
Lingulella crse.
Obolus OO.

1k. Gray & dark
colored massive

25

125. 65.

92.
460.
60
520.

bedded lim[e]s that
contain considable
arenaceous matter
Usually they break
down into slaty +
shaly fragments. 155.

1l about same as
1a. 73.

1m ~~Pit~~ - Purple
Pil - sh. 18

2) ~~1n~~ - Bluish gray
laminated limestone
the lamellae 1/4 to
1.5 in thick. The alterna-
ting lamellae being
buff weathering mag-
nesian & bluish gray
weathering gray lim.
The lamination
disappears in massive
bands wh is then

a thick bedded more
or less magnesian
limestone.

This series forms cliffs
near the top of the
mountains overlooking
Glacier Lake Canyon valley.
Only a few fragments
of this latter were noted.

3 Shaly & thin bedded
quartzitic gray sandstone
weathering brown but
colored, in a few
layers near the top
from 4" to 16" thick

62.

4 Hard arenaceous
shale

At 78 feet from base
this layer of calcitic
limestone appears and
carrying beautifully

52

19

260

95.

475

60

535

95

12

68

340

preserved Obolus.
(Loc 64 g.)
Agnostus —  . Plump form,
Ptychoparia

78 ft.

3b Fine arenaceous
gray shale, weather-
ing drab.
at 107. a layer of
hard, gray ~~rather~~
crystalline limestone
occurs with numer-
ous fossils.
at 286 feet up massive
layers 2 to 3 feet thick
of (sandy) gray ~~appear~~ limestone
appear & form little
ledges in the shale
all the way up
at 368 a ~~few~~
ferruginous limestone
layer is seen with
many fragments of

106

530
175

605
372

777.

48
5

~~240~~
272.
100

7

of trilobites

At 605 feet up (")
the interbedded lime-
stones cease & the
hard, gray finely
arenaceous shale
continuing on up with
a few layers of
interbedded lime-
for 370 feet.

975 ft

4. Hard gray
semi crystalline
coarse limestone
with numerous
fragments of trilobites.

325

5. massive cliff
forming bluish-
gray limestones.

221
173
136
335
520
140
975
325

2725

1470

62

78

975

325

8/1922

1

Aug. 14 | 22

~~Tunnel~~ Mountain

A roughly measured section two miles north of the preceding section on the north east slope of Hamil Mountain shows several marked changes in the character of the bands of limestone and there appears to be a thickening of the beds between the Aphileta fauna (66k) & the top of the Ivans. In the southern section the Aphileta fauna is first seen 255 feet below the top & in the north section it is about 400 feet below. It may occur higher up but it was not observed. One of the important discoveries

in the north section ~~was a~~ is the Phyllograptus fauna in ½ of the section.

This section measured is as follows -

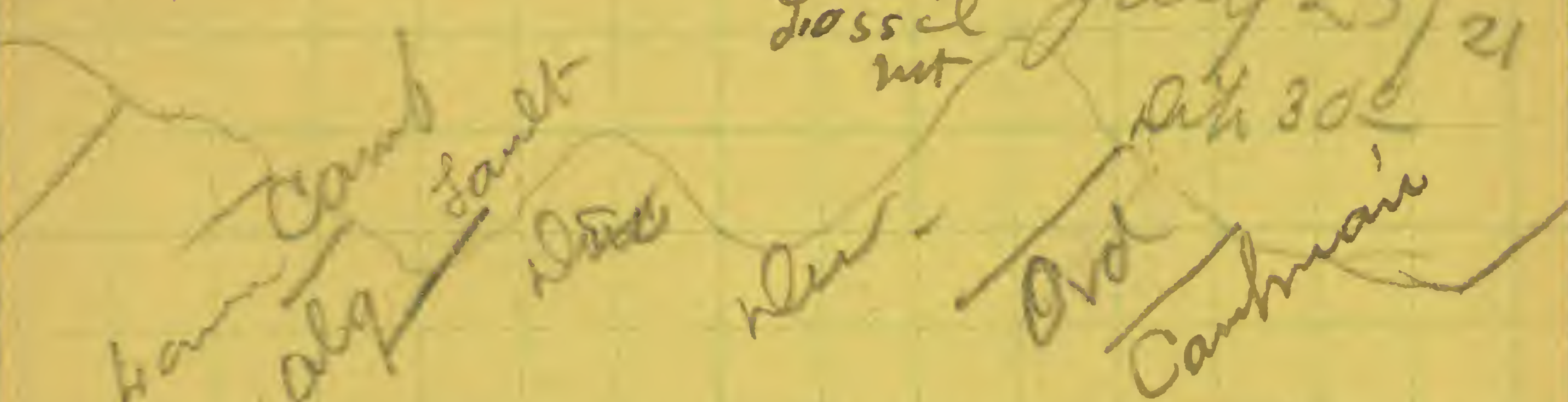
Mons formation.

3

1921

Fossil Mt. Section
Baker Lake

July 23/21



9 mi. N.E. Lake Louise station C.P.Ry.

Section

Devonian.
Dark grey [illegible] arenaceous lime with Stromatoporoids & corals — shaly [illegible] at base.

Ordovician.
Sarbach formation.
St. N. 30° W. dip. 30° W.
[illegible] light grey magnesian lime in thin layers with a few thick layers alternating.

145.

145.
48.
150.

343.

8/1924

Aug. 28" 24.

Upper Lyell
on Tilted Mt. Brook
below Lake
Going up in
section.
St. N. 15. W. Dip. 40° W.
Buff mag lm

1m/1. Shales with thin interbedded
bluish-gray very
fossiliferous lm. 38 ft
(Loc. 20)

1½2. Thick layers of
interbedded gray &
drab colored lm 5'10"

1k3. Like 1, 16' 2"

1j4 " 2. 4'

1i5 — 1 (3) 18'

1h6 2 (1) 6'

1g7 1 (1) 6'

45 — 19

62 — 118

107 — —.

4

12

30

75
62
11
15

60. 267

275

30

RP
120.

8 Buff mag. 58'
at 30' along the
Cryptozoan head
occurs in fine
exposure.

9. Shale & interbedded
lmn. (Loc. 20d) 45'

10. Buff lmn. 62'

11 Blue & gray lmn.
interbedded in
buff mag (Saukia zone)
20d 16'

12. Buff mag. 15'

13. Arenaceous
shale & silted
fabric. 15'

14. Mass
Lee Silted Fall
Dolm

8/1924

Aug. 27"/24

Briscoia fauna.

At Tilted Falls where Tilted ~~mountain~~ brook enters the broad upper canyon valley of Baker Creek ~~thick~~ beds of buff colored mag^ lim^ cliff 60° west & over ~~these~~ ~~the~~ the water slides & falls. About 130 feet (m) back from the highest layer a band of ~~shaly~~ shaly & thin bedded gray ~~limestone~~ & magnesian limestone 20 to 30 feet (m) is interbedded in ~~the~~ (magnesian buff) limestones. Fragments of trilobites occur in the gray limestone & among them a large species

Briseora cont.

of Briseora. This is
the band from which
the Briseora of
locality 20d was
collected 5 miles to
the south.

.8 Jms

8/1924

Aug. 25/24

Going up in section.
Colton Grass Canyon.

Fault -
East of fault -

Marine bedded gray arenaceous mag - lim.
Upper Cambrian?,

West of fault -
Sullivan formation -
1. Thin bedded light gray mud rocks with some thin layers of bluish gray lm - with many fragments of trilobites -
Str N & S.
dip 80° near base
35° W - near top. ft
Est. 300
Measured. 210.
510

56
316

16
6

216

Section. Contd 2

Lower Lyell -

1a Thin bedded ~~purplish~~ arenaceous & calcareous purplish, buff & gray with shale partings. Ripple marks & mud cracks.

275'

1b Thin bedded, steel & bluish gray & hard lms with some oolitic layers - 310'
Many fragments of trilobites in oolitic & bluish gray lms.

1c Reddish brown more or less arenaceous lms breaking down in fine talus -

190'

Lyell Proper.

1a Thick bedded, hard rough weathering gray -

370
30

35
20 31
6
186

185
1010.
30
980

34 483 1166
204 498 16
195 480

1a 980.
1b 480.
1c 195.
1655

Lee Canada 3 —
lm — Gray — dc —
Measured 980'

1c Thick bedded gray
reddish buff medium — V
rough surface lm —

Get 180 ft up the
canyon to the
Chelonia? ? ? ceiling
Measure? Dec 1921
section of these beds
with Lithologic
notes

See arroyo
Tilted Falls

380'

1c Thick bedded
gray, rough weathering
Marl. lm —
Thick 350 to 400 c m.

Lateral Lyell
Measure. Marl. lm 195 —
1555.
1 — Bluish-gray thin
bedded lm — Lithologic
Fauna, correct Limy Sh. 210
Fragments
Invertebrates

Section - Cont'd (4)

Contact by soil + vegetation.

8-27"24

Crate at 1c. above Tilted Falls. 1.6 mile (~~1.6~~ Km) south of Cotton Grass Canyon

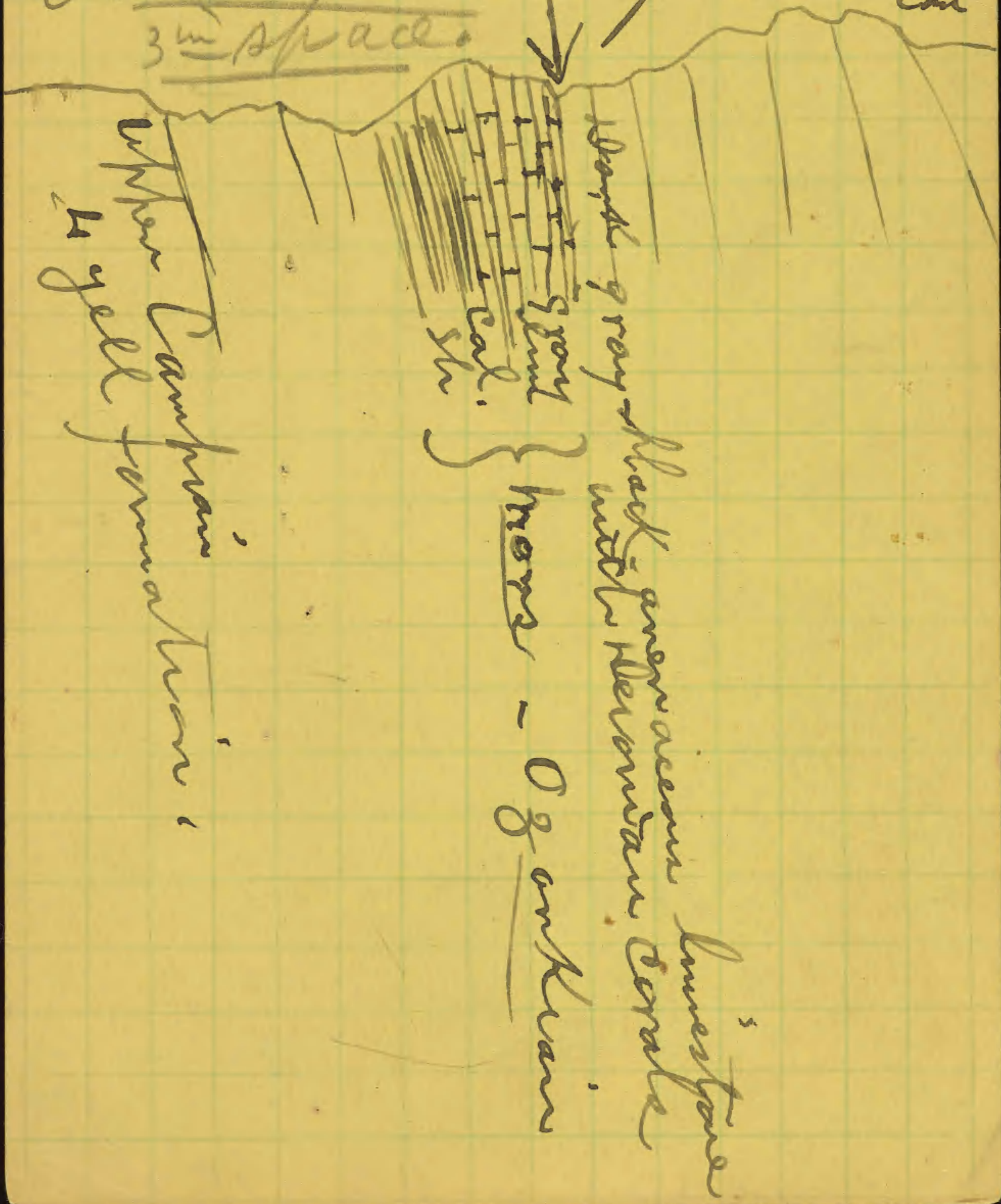
~~third~~ layer a ~~cliff~~ of fine grained limestone dipping 60° west has an exposed face about 75 feet (m) high & a long distance on the north & south strike. Its upper surface is formed of cylindrical Cryptozoan 40 - 16 mi (— m) in diameter, all standing at right angles to the surface

Brisenia fauna

about 60 feet (— m)

July 19/22.

Contact Mons formation
& Hermian on south
side Ranger Canyon
Sawback range. Alberta



8/1916

(1) Aug. 9 - 12 - 1916

Ptarmigan Pass Section

~~East~~ + ~~northeast~~ face of Ptarmigan ~~mountain~~ Peak above the Pass and Lake. It is 5.5 mi (Km) northeast of Lake Louise station on the Canadian Pacific Railroad Alberta Canada. The summit (own) (Middle Cambrian) Cathedral formation.

Section

1. Massive bedded (cliff forming) arenaceous limestone mostly of a light gray color but with a few dark, lead colored bands of more or less irregular boundaries above and below. The dark bands are usually formed of ~~a~~ more thinly bedded + a finer arenaceous limestone. 2100

of Ptarmigan Peak is
formed from the Cathedral
limestone & a fine section
is exposed from the summit
down to the lake and
on the northeast down
to the pre-Cambrian (1).

(1) S — M — Coll. Vol. 63
1910, p. 429.

P. P. section.

~~1)~~ 2 ~~Thin bedded~~

No fossils except traces of annelid borings.

The thickness of 2100 feet is ~~based on~~ an estimate based on the height of the mountain and the height of the base of the light gray arenaceous limestone, ~~the level of the~~ above Ptarmigan lake, ~~being taken as the starting point.~~

Ptarmigan Formation.

1.a Thin bedded fine grained, hard, dark gray to grayish black arenaceous limestone 46 ft.

Fauna (over) ~~(3)~~ B ~~(Over)~~ ~~Neolenus sp.~~ ~~Bathyuriscus (Pahvella?) cf. sp[illegible] Walcott~~ ~~Neolenus sp. undt~~ (a) (B)

Fauna. (63b). Alphonsides?
pygidium species undt.
Dorypyge species undt.

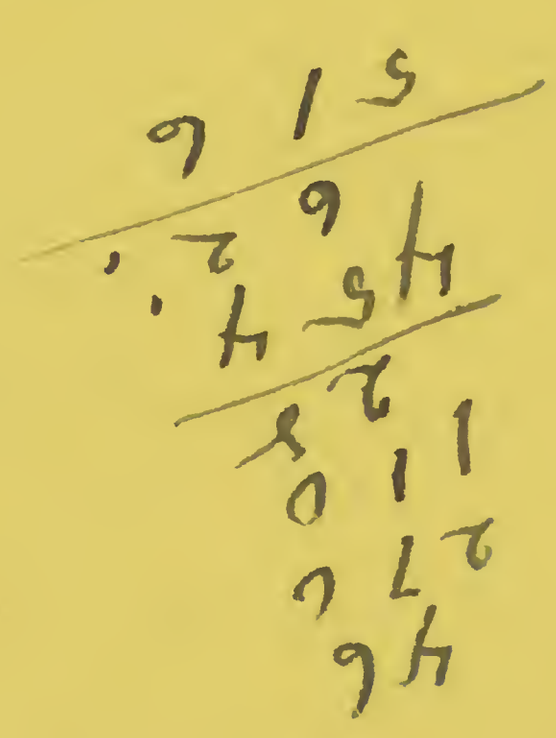
This bed usually breaks down to form a slope beneath the Brassine Cathedral limestone but in places it forms a ~~steep~~ low escarpment.

b

~~Light gray~~ Finely arenaceous limestone in thick alternating bands of a light gray & dark lead gray color ~~limestone~~. The lower 20 feet is a light gray, finely arenaceous laminated limestone the lamellae showing finely on the weathered surface. 270 ft

Fauna.— Traces of annelid borings occur abundantly within the layers & on their ~~layers~~ ~~20~~ surface. The Ross Lake shale member of the (over)

of the Planning formation
channel if I went occur
about 100 feet down
in this section. I did
not find it.



P.P. section

1c Massive headed bluish-gray & light gray more or less finely arenaceous limestone with many dark layers of calcite limestone the balls varying from 5 mm to 25 mm in diameter. 110 ft.

Fauna

a few minute fragments of trilobite tests were seen.

2d Thin bedded dark bluish-gray limestone that may on may not form a portion of the cliff. 28.

(63d) ~~Fauna.~~

~~Acrotreta~~ Lingulella spicula

~~Hyolithes~~ —

Nisusia alberta — Wolcott

Ptychoparia (granulated species)

" " (~~broad border~~ Elevated eyes & frontal rim)

~~Total of 2m~~

P.P. Lecture

5.

finely laminated and
shaly flinty gray limestone
with a few interpolated thin hard layers.

62.

This band of almost
fossil limestone & shale
is a marked feature in
the section. It is crossed
diagonally by joint planes
that cause it to weather
into projecting points that
give the rough surface of dog
tooth spar. This may
be seen on the face of
the cliff of Stanniganmountain
distance also on
mountain on the south east side
of the Pass. Stanniganformation
Total thickness of N. 516 ft.

8/1916

Aug. 9th/16.

Whyte formation,

Ptarmigan Pass.

The section 1909. was
in connect in including
the upper 400ft of limestone
in the Whyte. This is a
calcareous portion of the
Cathedral series, or a
new formation interbedded
between the Whyte and
the Cathedral. It is not
present in the Assiniboine
& Phaeo Peaks sections.
Found heads of ~~Bathyurisc~~
63rd Dowlingia in upper beds
& a Arealenus??

tail

In the calitic limestone
of the upper portion of the
Whyte found a few

(63a) Fragments of trilobites —
Nileus —
Dyalithes —
Ptychoparia —

The section of 1909. shows 325 feet of limestone above the arenaceous shaly beds much of which is oolitic. The oolites vary in size from a millimetre to two centimeters — The former usually being segregated in layers 2 mm to 6 mm thick — Fragments of trilobites occur in some layers but usually the oolites fill the space so completely that they touch each other. About 100 feet up fragments of a species of Ptychoparia occur with a Nileus & an Dyalithes.

8-12-16

a) Fine grained arenaceous shale with fragments of trilobites ——— 43 ft

b) Thin ledged arenaceous shale alternating with campact thin layers of uneven, greenish & brownish gray sandstone the surfaces of wch are thickly marked by annelid trails & burrings. This band forms a low cliff on the face of Redoubt ~~mountain~~, Ptarmigan & other mountains in this vicinity where not covered by talus from above. 57 ft

c) Arenaceous & calitic limestone alternating with shaly sandstone similar to that below.

55.

$\frac{184}{15}$

23.
115

$\frac{115}{5}$ 3

 8-12-16

at 23 feet thicker
layers of oolitic lim
appear (3in to 8in).
at 62 feet fragments of
trilobites occur abundantly
in an oolitic & concretionary
limestone.
at 85 feet found a
number of heads & tails
of a Pty-like trilobite

Large postero-lateral limb,

(Loc. 63c)

135 ft

at 135 feet up the alterna-ting
oolitic & arenaceous beds
terminate. ~~are capped by~~ finely laminated
& shaly bluish-gray lime-
stone with some thicker
beds

135.

E) 5 4

62

17.
43.
57.
135
62
314.

This band of thin almost fissil limestone & shale at the ~~base~~ top of the ~~whole~~ formation is a marked feature in the cliffs on the west side of the Pass. It is checked by diagonal joint planes that cause it to weather in a dog tooth offset that is very striking. It is 62 feet thick.

Above the shaly limestone there is a band of thin bedded blueish-gray limestone that extends up to the base of a cliff & it is sometimes merged into the cliff.

(83) In this band found
Acratopeta ×
Hyalithes +

47

235

35

290

160

100

10

Misuse a — of alberta —
pty — high eyes —
" — broad frontal border
Thickness 28 ft.

Massive bedded bluish-gray to light gray more or less arenaceous limestone with many ~~thick~~ layers of ~~large~~ oolitic limestone with oolites 1/4 to 1/2 in to 3/4 in in diameter.
110 ft

Light gray, arenaceous laminated limestone ~~the~~ lamellas showing on weathered surface for about 20 feet at base.
alternating bands of light gray & lead gray finely arenaceous limestone

40.

46
270
110
28.

454

5 8-12-16

alternate –
Traces of annelid
boring occur abundantly
in & on the surface of some of the
layers –
270.

Thin bedded, finely grained arenaceous limestone
forming a compact
cliff in places but
usually breaking
down to form a terrace
beneath the massive
Cathedral limestone.
Fauna –
63 Bathyuriscus (Poliella) cf
sylla walcott 46

~~Ptarmigan Peak~~
~~on the north of Forth~~
~~Inst.~~

~~For section of Cambrian~~
~~see next pg.~~

~~Section worked out on~~
~~Aug 15 & 16 - Two cold~~
~~windy cloudy days.~~
~~Ice formed at night.~~
~~Stuart with me on~~
~~both days.~~

Ptarmigan Lake section

Aug 16" / 09

" 9-12, / 16

Cambrian section Aug. 16/09 (4)
on northeast face & slope
of Ptarmigan Peak. Every
bed is exposed either on
the crest of the ridge on
on the west side of the
ridge. The section faces
Ptarmigan Lake & may
be seen in its entire
extent from the northeast
side of the lake.
The Summit of the Peak
is formed of the massive
bedded quartzites of the Cathedral
formation. I did not
measure the thickness
but estimated its thickness
by measuring up to its base
from Ptarmigan Lake which
gauges 400 feet.

Summit of Peak	10,060
Lake plus 400.	7,960
Thickness of Cm	2,100.

26
78
5

390.
52

442

19
52

285
38

323

55
135
65
90

365

Ptarmigan Peak section 5

1909

Cathedral formation.

1 Massive bedded, arenaceous limestone mostly light gray but with a few dark lead colored bands 2100,

Mt. Whyte formation.

b Dark bluish gray limestone in massive beds that break up into thin layers on weathered slopes. Forms cliffs on Fort mountain. 440

a Shaly thin bedded dark gray limestone with oolitic layers in lower portion (fossils). 325

b Gray + greenish gray arenaceous shale 28

26
76

380
50

43
138
690
95

7855

75
140
2000.
95

60

8/1914

Aug. 4/16.

Whyte formation

The upper portion of the Pharos Peaks is formed of the Whyte formation & the ravine between the Peaks and the main range is eroded in Greenish & pinkish shales & thin interbedded greenish quartzitic sandstones As at Wonder Pass there is very little if any calcareous matter in the Whyte formation until near the base where there is a band of arenaceous & calitic limestone, owing to local faulting the upper portion of the section is broken & cleaved & in places cut out. The latter was probably in

Aug. 4/16

~~there appears to have been~~
a plane of nondeposition
or erosion prior to the
deposition of the great
cliff forming Cathedral
limestone.

Fauna.

Annelid trails of various
sizes & numerous trilobite
tracks & burrows occur
on the surface of the
greenish arenaceous shales.
An abundant life was
present but the currents
drifted the ~~trilobites~~ shells
etc elsewhere or
destroyed them by
attrition.

Alberta Can. July 22/04

Lower Cambrian
Fairview formation
Fort Macleod

North face of Fairview mountain above Lake Louise. (Alberta. Can) 3 mi South of Laggan.

The Lake Louise shale forms a slight break in the cliff that affords a foothold for small conifers trees & there is usually a growth of green mosses & lichens. Below the green vegetation the Fairview formation forms a wall of hard quartzitic sandstones. This same feature is also

2/

Fairview

present in the north face of Saddle mountain and eastward on the ~~to~~ cliffs of Mt. Temple. & in the Valley of the Ten Peaks - above Moraine Lake.

~~On the~~

At Fairview mountain the section below the Lake Louise shale is as follows -

Fairview formation:

1.

Massive bedded pinkish hard cliff forming quartzitic sandstone in layers 6 inches to 3 feet thick, forming a vertical cliff in its upper 150 feet (on back) 350.

On Mt. Temple the sandstone has a strong purple color and in the lower portion bands of dolomitaceous

add to 1.

Calan gray in ~~wh~~ layers & gradually becoming pinkish colored with gray bands- Some layers are slightly cross bedded

(Jaurez

purple shale.

2) ~~Sandy~~ Hard gray (rather coarse grained sandstone in the lower 100 feet with layers varying from shaly beds to a foot or more in thickness. (On back) 570.

3. Siliceous, gray and greenish gray shale 20+
slope covered with debris.

On the north slope of Saddle mountain Smile southeast this shale has a thickness of 28 feet and below it about 100 feet of thickness of coarse gray sand, stone to fine con-

Add to 2.

~~helabout 200 feet down~~
the sandstone becomes
coarser & passes into
a fine quartz conglom-
erate in massive
layers —

4. Fauvrien

glomerate 12' exposed on the north slope of Mt Temple 2.5 miles Southeast of Paddle mountain the basal beds of the lower portion of the Fauvrien formation rest on the dark, fine-Cambrian clay argillaceous shales. The sandstone & fine conglomerate medium of the

section above is not ~~in condition~~ accessible for measurement.

Ten miles further southeast on Little Vermilion creek the basal conglomerate is ~~formed~~ in of massive

layers ~~of fine con-~~ (Fairview)
~~glomerate~~ ~~that~~ further
contact with the
pre-Cambrian is
obscured by debris.

Crossing the Bar
valley to Fort Mountain
½ miles northeast of
Fairview mountain, the
basal conglomerate
is seen in contact
with the pre-Cambrian
and above it there
is a band of shale
44 feet thick.

The conglomerate has
a thickness of 360 feet
+ is much coarser
than on Saddle moun-
tain or Mt. Temple.

Resume'

~~On the~~ Three miles

6 (Hermit Formation

To the N.W. on the
N.E. of Ptarmigan Peak
the Fairbanks formation
is much thinner. A
measured section gave.

1) Thick bedded, light
gray occasionally cross-
bedded, quartzitic sand-
stone with a little
trace of purple color
in a few layers 260

2) Light-gray and to
brownish gray sand-
stone in thin layers 22

3) Massive bedded con-
glomerate, with white
quartz pebbles & frag-
ments of dark & green-
ish fine grained shale
in a coarse sandstone
matrix 170.

6. Fairview.

Talent. 452.

Pre-Cambrian sediments.

The impression given by this section is that the sediments were deposited on the slopes of a pre-Cambrian shore line and did not accumulate to the thickness of the marine deposits ~~three~~ four miles to the ~~south~~ S. S. W.

Summary. The Fairview formation consists of four members in the greatest development.

a. Quartzitic sandstone 350-
b. Coarse sandstone 570-

920
404

1324

I (Fairview)

c.) Silicious shale — 44 .

d). Arenaceous, quartzitic conglomerate — 360.

1324.

It is delimited above by the Lake Louise shales & below by the basal conglomerate resting on various ~~beds~~ beds of the arenaceous pre-Cambrian shales.